History and Principles
of
Osteopathy.

GUIDE TO THE

Tablet System OF Bookkeeping AND Business Training

INTERMEDIATE
COURSE.

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LECTURE #1.
Introductory.

I am glad to meet you and trust all are prepared for work. A trite old saying is that a man is beginning to learn when he recognizes the fact that he knows very little of what is to be known or can be known. I trust we have reached such a stage in our life. I assure you there are many things that I do not know, and doubtless a few of which you are not coginzant, probably this one reason why you are here. Likely there are many others which you have answered successfully to yourself. But one I think as important as any, is this:

That disease will not disappear from the earth so long as man is an inhabitant thereof, nor will he cease to want a physician. (See definition in century dictionary)

Dr. William Ewarts discusses this question in his Harveian lecture which was delivered in London during December. He said that one source of our nervous ailments is an outcome or an outgrowth of our nineteenth century Chemistry and advertising and that intemperance in drugs is becoming more common and may possibly outstrip the use of alcohol and its evil effects; that a few advertised drugs may be comparatively harmless while others are more dangerous and their continued indulgence leads to confirmed neuroses or hopeless neurasthenia so that as therapeutic activity tends to abolish disease, the public manufactures it. Just to illustrate, I will cite you a case or two in point. (Mrs. J. of Clarinda, who has been taking morphine for ten years, Mrs. H. of Clarinda, taking medicine three times a day for one year.)

Thus you see their physiological condition at present is a pthological one. What I mean by this is, that their system to do certain work seems to require these drugs. It is not a true physiological condition, but a morbid one and demands help from us. We are satisfied then of our need as Osteopaths. It becomes necessary for us to be conversant with some of the principles and to understand at least a part of the philosophy of Osteopathy. Let us now define Osteopathy. Here is a definition. I like it, although you may not. Then prepare a better one and be suited. Osteopathy, aside from dislocation and subluxations and their effects, is that science which regards disease as the product of an obstruction to, or derangement of nerve force and circulation and treats such diseases by manipulation, stimulation or inhibition of nerves and nerve centers, thereby removing the obstruction or correcting the derangement so that nature may resume her proper function. If this definition is a true one, it is by means of the circulation and the effects we can get on nerves and nerve centers that the work is accomplished. Is it possible to obtain such far reaching results? I answer yes.

The first question then, does the circulation affect cell life I answer yes. The body is composed of cells and intercellular material. The cells at present most interest us. In regard to the question, unless there is a nutritive exchange of the whole body the cell dies. That which constitutes the nutritive exchange of a

cell constitutes the nutritive exchange of the whole body. There is a continuous breaking down of tissue constituting waste and this must be met by a building up of tissue or repair. This repair is furnished by food, digested, absorbed by lacteals and blood vessels carried by them to the capillaries, there it passes out with the lymph, to come in actual contact with the cells. There it is taken up by the cells to replace what has been broken down, to supply force for assimilation, and all the activities of cell life. This proves conclusively that the circulation is the means whereby a cell is furnished with food material which is its life. Is it possible to affect the circulation? Yes, being by or through the nerves. (Vaso-motors)

Second, do the nerves affect cell life? One way has just been mentioned. Indirectly they affect cell life by the action of the vaso-motors on the blood vessels. The second way is the effect of the nerves on the nutrition and function of cells directly. Notice what Green says in regard to this: "The nervous system has an important influence over the nutrition and function of nerves, muscles and such glands as act normally only in response to the stimulation of special nerves. Further, while it is uncertain whether the nervous system has any analagous influence over the other tissues, such as connective tissues and epidermis, yet lesions of these tissues are frequently found associated with diseases of the nervous system."

Although it is not a general law (That is proved conclusively) that the nervous system has this very important influence over the nutrition and function of all the cells of the body, yet it is general enough that it may be well for us to mention the theory as to how this influence may be exerted. I will let Gowers speak on this point. He says: "The ending of motor nerves transfer in some way the nerve energy to the muscular protoplasm, at least it disappears in making the muscles contract. This must involve continuous molecular contract, and this continuity is probably the means through which the nutrition of the muscular fibers are influenced by that of their nerves."

If this law was general in regard to the errect of nerves on nutrition and function of all cells it would then include all tissues of the body. As shown above, it does now include many parts of the body and some day may be proven for all. Thus we see that cell life is affected by the circulation and nerves of the body. As to the proof of the statement that the Osteopath is able by these means to affect cell life and thereby the whole body is left for some future lecture.

As to our reliance upon such means as the cure for disease I think we have good grounds for believing it to be sufficient. I will quote some authority for such a statement. Lister proved the law "That every cell has the inherent power to recover after injury: "Again that the vitality and fertility of protoplasm makes regeneration possible.

Vitality known as vital energy is the ability to affect the chemical and physical changes on the ingesta into the simpler compounds of its excreta. This power or ability is inherited; that is its vital activity. The fertility of a cell depends upon the amount of nutritive material which it gets. So in order to increase that function it would mean an increased blood supply.

This brings us back to our first statement, that the blood and nerve supply affects cell life, and especially is this true if we wish to make regeneration possible. Nor are we the only people that think such processes are the means whereby we may assist nature in her work.

Listen to what Dr.W.P.Wherry has to say on the replacement of damaged tissue. "When a limb is torn from a crustacean a new one grows in its place. Human beings do not go quite so far in the replacement of lost tissues, but we still retain the power of regeneration in a degree quite wonderful." He says this has proven one of the greatest resources of modern drugery. Again he says: The production of regeneration of the soft parts of the body is not limited to the skin, muscles, fascia, ligaments and other fibrous soft tissues. It also includes cartilages and bones. Nor is the frame work of the body all that is amenable to regenerative repair, but brain tissue and reproduction of genuine cerebral cells; in the eye also we need not even despair of the regeneration of the crystalline lens."

What is it they claim makes all this regeneration possible? This same vitality and fertility of protoplasm of which we have just spoken. If such wonderful results can be obtained where cell tissues are thus mutilated with the knife, may not the Osteopath hope to attain an hundred-fold more by regulating the source of cell energy without any injury thereto further than has been caused by the ravages of disease.

Such being the case, how necessary for the osteopath to locate the cause of a disease so that he may thus the more readily regulate by means of the circulation and nerve forces the morbid condition which is present in the system. A warning here. It would not be well to try to prove that all your patients' troubles are caused by misplaced bones, as beginning Osteopaths are want to do. I knew such an one and it sometimes lead him to make queer statements. A case in point. (A Mr.Payton, pain on underside of third toe on left foot.) Such knowledge of the patiein's ills leads one not to be an imitator or a copyist, but makes him able to affect the nerves in any part of the body in the manner which he knows it is necessary to do in order to get the required result. Let our aim be to attain such results.

Lecture No. 2.-1.

THE SYMPATHETIC SYSTEM.

I wish to-day to speak of the sympathetic nervous system. This is a very good place to begin, followed by centers. What I will give you to-day will be according to Quain & Gray. These nerves are distributed to the internal viscera, glanular organs of the body, lungs, heart, and blood-vessels and to the unstriped muscles generally. Sometimes to these organs, such as the heart, lungs, and upper and lower part of the alimentary canal, receive fibers directly from the spinal cord. The sympathetic nervous system consists of; first, the two great gangliated cords. These extending from near the base of the scull to the coccyx, placed symmetrically, partly in front and partly on the sides of the vertebral column. Second, the three great gangliated plexuses called the prevertebral plexus. These are placed in front of the spine, single and median and are named from the region in which they are found; viz., cardiac, solar, and hypogastric. Third, the small ganglia situated in relation with the abdominal viscera. Fourth, the numerous nerve fibers. These nerve fibers are of two kinds; (a) communicating, by which the ganglia communicate with each other and also with the cerebro spinal nerves; (b) distributory, these supply the viscera and the walls of the blood-vessels. The gangliated cords are composed of numerous ganglia being connected with each other by these connecting fibers. In the cervical region there are three ganglia; viz, superior, middle and inferior. In the dorsal region there are commonly eleven or twelve. Only one the first receives a special name. It is called the ganglion stellatum. In the lumbar region commonly four. Four in the sacral although may be five, and one coccygeal, called ganglion-impar. These ganglia are connected with the cerebro spinal system by white and gray rami communicantes, ramus means a branch, therefore, means communcating branches. The white are the very fine medullated fibers passing over the spinal nerves to the sympathetic cord. These fibers are believed by some to spring from the anterior roots alone, while others claim that they leave the cord by the posterior roots also. (:488) These fibers from the posterior roots do not degenerate after section of the root containing them, therefore, they are not of spinal origin. Thus it seems that fibers of spinal origin do leave the cord by anterior roots alone, except by certain cranial nerves, which according to Quain, contain visceral branches Some of these fibers end in the gangliated cord, although they may ascend or descend for a considerable distance before ending in a ganglion, giving in this way a very wide distribution. Some end in an efferent ramus. An efferent ramus or a rami efferentes are the branches going to the pervertebral plexuses, consisting of pale fibers from the gangliated cord and medullated fibers of spinal origin. According to Gaskell, in man it is most probable that these white rami leave the cord from the first dorsal to the first or second lumbar. There are branches from the 2d, 3d, and 4th sacral nerves going directly to the prevertebral plexus. Therefore, they are called visceral branches of pelvic splanchnics. These correspond to the white rami communicantes, although in no way connected with the gangliated cords. In this same group are viaceral branches of the 9, 10 and 11, also facial and third nerve. Kolliker classifies these white fibers as follows: First, sensory which runs in posterior roots when derived from the spinal nerves. Second, vaso and viscero constrictors and the 9, Lo and 11, cranial nerves. These contain the pilomotor nerves and the motor nerves

of the sphincter muscle of the iris. These end in the ganglia of the sympathetic. Their action is produced by pale fibers springing from the cells of the ganglia. Third, vaso dilator and viscero inhibitory; there are from the 9, 10 and 11 cranial nerves and the anterior roots of the spinal nerves. These are continued as medullated fibers and their respective organs forming no connection with intervening cells. They gray rami are pale fibers non-medullated. They pass from the sympathetic cord to all the spinal nerves and for the most part spring from the cells of the ganglion nearest to the spinal branch with which it is connected. They then enter the anterior primary division of the spinal nerves. These fibers are then directed, both peripherally and centrally. We will speak of those passing cerntally first. Some pass off in the posterior primary division of the nerve, others enter the sheath of the nerve the surrounding tissue in the intervertebral foraman and the duramater, running up to the duramator in the posterior roots. The fibers pass distally in both the anterior and posterior primary divisions of the spinal nerves. They supply the vaso-motor nerves ard the arteries of th body- wall and limbs, pilo-motor fibers to the muscles of the hairs, and secretory fibers to the sweat glands. There is also a branch given off from each gray ramus, which accompanies the recurrent branch of the corresponding spinal nerve. This branch is distributed in the spinal canal, also to the vertebrae ligaments, blood-vessels and duramater . There are other filaments which pass over the bodies of the vertebrae. It seems that they supply the intercostal and lumbar arteries, the ligaments and bones. Many patients come to us with a weakened spine, with others there is a condition bordering on paralpsis. The Osteopath is able to treat them and successfully too. It is by means of these nerves centerally distributed. This would also include the branch accompaning the recurrent spinal nerves. There is one point yet. How do we get the effect on the skin? This is through the secretory fibers of the sweat glands which are contained in the branches passing distally in both the anterior and posterior primary divisions. I defined the three great prevertebral plexuses. One thing more in regard to them. They receive branches from the cerebro spinal nerves, also from both of the gangliated cords of the sympathetics. They consist of centers from which the viscera are supplied. Thus you see the forces at the command of the Osteopath, for through these nerves it is possible to regulate the internal viscera to a wonderful degree. To show you that this is a true statement, I will illustrate. A violent blow on the epigastrium will stop the action of the heart and why so? There is a constant restraining influence maintained upon the action of the heart by the medulla, through the fibers of the vagi nerves. (K.427,428) The blow stimulated the abdominal sympathetics. These act as afferent fibers to the medulla. There the stimulus is reflected down the vagi, the efferent fibers, to the muscular substance of the heart and the beat is stopped (Corbet & Fitzsimmons fight). We have gone over the sympathetic system in outline without defining a ganglinn. In fact it seems anatomists and physiologists leave us in the dark as regards them. It seems though, that the useof a ganglion cell is to receive and transmit impulses,(Century). They may have the functions of distributing, increasing. and diminishing and in some cases apparently initiating impulses as well as being a trophical center for nerve fibers connected with them. The spinal ganglia have unipolar cells and one

neuraxon (Axis cylinder proceds) usually gives rise to a medullated fiber. Sympathetic ganglia have multipolar cells giving rise to 2, 3, 4, and even 5 neuraxons and it is cintinued as non-medullated fibers, (Foster 127). Thus an axis cylinder process leaving, the cerebro spinal axis, by the anterior roots of the spinal nerves and the cranial nerves spoken of, enters the sympathetic ganglion where it ends in terminal twigs, probably in contact with the sympathetic cell, (H.488-9). There the sympathetic cell becomes a trophical center for a number of fibers leaving it. Its power being such that it may apparently initiate impulses. This is true for the vaso motor, pilomotor and secretory nerves. By this means we understand how it is that a few fibers leave the spinal cord, are of such a wide distribution sympathetically. Truly, the sympathetics are of vast importance to the Osteopath for through them he may affect the whole internal organism, (explain or give viacra branch of the 3rd, 7th, 9th, 10th and 11th nerves.)

LECTURE No.3 1.

Today we speak of centers, both osteopahtically and physiologically. Osteopaths reason in this manner from effect to cause, from periphery to center. Also from cause to effect. In this way if there is any discoverable lesion, we reason then as to what part of the body is effected. Because certain parts of the cord and the sympathetics govern certain distinct parts of the body. The spinal nerves being segmental it seems likely that the better the osteopath the more readily does he reason in this manner. The normal condition of the body must be understood before the abnormal can be known. To illustrate; if in making a physical examination of the body a lesion is found near the middle dorsal and a soreness on right side under lower ribs, it could be said almost to a certainty that the liver was affected.

Centers in the Medulla. 1.Respiratory (vaso motor) Cardiac. deglutipion, phonation, mastication, expression, salivary glands, spasm, sweat (Vaso delator likely)

Reflex centers (Closure of eyelids). sneezing, coughing, laughing, sucking, vomiting, dilating pupil - Renal center.

Fever centers.- Medulla (dominant center) (via 1 & 2 cervical) 2 to 6 or 4 to 10 dorsal, 5 lumbar. Peritoneum.

Manipulation of the bowels is very beneficial in fevers. There are three reasons. It affects the sympathetics by the peripheral ending of the abdominal nerves through the peritoneum.

(b)Stimulates the mesenteric plexuses,Auerbachs & Meissuers, These control motion and secretion of the intestines.

(c)Opens the bowels by mechanically breaking up the clogged or constipated condition.

Vaso Motors of the head:- The cervical sympathetics contain vaso constrictor fibers for the same side of the face, the eye,ear salivary glands, tongue and possibly the brain. Also a general vaso motor effect on the whole body.

Vaso dilator fibers have been found to exist in the cervical sympathetic. It seems that they connect with the 5th nerve and in this way reach the eye, face and mouth. In fact it is possible to affect many parts of the body through or by the cervical nerves because of the wide distribution. Some operators say in treating the neck, taking the 3rd cervical as a middle point, above this

work upward, below this point work downward.

Centers for larynx: 1,2 and 3 cervical. The origin of Phrenic 3,4 and 5 C for hiccoughs. The superior cervical ganglion lies opposite the 2nd or 3rd cervical vertebrae. It is connected with the first four cervical nerves. The middle cervical ganglion lies opposite six or seven cervical vertebrae, and is connected with five and six cervical nerves. Thus you see we get vaso motor effects from the 3rd, 4th, 5th and 6th cervical nerves and may be the 1st and 2nd.

The center for the lungs is between 1st and 2nd dorsal vertebrae. Generally given as from 2nd and 8th dorsal.

There is a ciliary or cilio spinal center between the 2nd and 3rd dorsal vertebrae also to the recti of the eyeball. This center really extends from 5th C. by the Sup.cervical ganglion. To dilate the pupil and contract the iris between two and three dorsal

Vaso motors for the arm, 5th and 6th dorsal. A center for the stomach on the right side between 3rd and 4th or 4th and 5th dorsal. If a patient is vomiting it can generally be quieted there Notice if there is not tenderness at that point. On the left side the vagus for the pyloric orifice.

We come now to the splanchnic nerves, meaning those to the abdominal viscera. The great splanchnic is from the 5,6,7,8,9, and 10 D. This is a center for the stomach as well as other organs of the body. Stomach especially from 2 to 8 D.

A center for chills: 8th D. We must in this connection mention controlling centers for the liver, because in malarial condition the liver is almost, if not always, affected.

Centers now. At angles of 5th and 6th ribs. 8th and 9th dorsal on right side. The splanchnics Vagi and inferior cervical ganglion. Small splanchnic: 9,10 and 11 D.

Smallest Splanchnic: 12 D. constituting a center for the kidneys. The kidneys are also affected at the sup. cervical ganglion: 6th D. and 2nd Lumbar.

Stimulation of the splanchnics is said to act on the thoracic duct and coupled with treatment near 7 C, will reduce fat.

A center for the heart in the corpora striata. 1st rib,1,2, 3,4,and 5 D. Vertebrae. To check the heart action,1st and 2nd rib. on annulus of vicussens around sub-clavian artery.

For heart flutter Lst rib.
Valves of heart 2 to 4 D.
Whythm of heart 3rd and 4th C.

The small intestines are above the 5th L.the jejunum 1st to 5th D.

Large intestines 1st to 4th L. For the peristallic action of the bowels, 9,10 and especially 11 D. It is also well to stimulate them anteriorly. I have found that the large intestines can be influenced greatly by strong treatment in the lumbar region. Cases of long standing constipation can be made to yield in this way more quickly than any other. Also stimulate flow of bile.

Spleen Left sphlanchnic or 8 to 12 D.

A Genito spinal center, hypogastric plezus bladder and vaso deferentia at 4 and 5 L.

Hypogastric plexux 5th L.

Coeliac Axis, 3rd L.

Parturition, micturition, defecation and uterus 2L. For defecation also a point between 4th and 5th L.

To relax Vagina 4th sacral.

To sphincterani , 5th sacral and coccygeal.
To the bladder, 1st and 2nd L.
To relax neck of bladder, 2, 3, 4, and 5 Sacral may be 1st Sacral.
Blood supply to the overies 10 and 11 D.
Parturition center 2L.
Cervix uteri 9D.
To body of Uterus 10 and LL D. via overies.
To uterus - Round ligaments on mons veneris.
To Uterus, Also inhibit Clitoris.
To the circulation when no discoverable lesion. Treat the superficial fascia.
2 D. for upper part of body. 5th L. lower part.
A cough center 2,3 and 5 C.
Cutaneous diseases, 1,2 and 3 C.
For eczema notice the atlas especially. Thyroid gland 4,5 and 6 C. In Goitre other treatment necessary.
Sweat center 1st to 12th D.
Fever center 4th D.
Emotional center 5th D.
The ligamentum nuchae - Its extent and attachment- Sometimes found contracted - means of relieving a head-ache.
To control headache 1,2 and 3 C. Sometimes when unable to handle it in any other way, 9 D.
Masturbation, Hydrocele and seminal weakness,2 and 3 L.
11 D. if misplaced may cause profuse menstruation, sometimes scanty flow. In flooding stimulate the uterine fibers by putting knee on sacrum, one hand on either ant. sup, spine fileum and draw backward. Also a quick jerk on mono veneris.
Night sweats, Give friction up the spine for its full length with the open palm.
Nervousness. Give a like treatment except that the hand is pushed downward along the spine.
Toothache - Branches of the 5th nerve.
This fact must be borne in mind that there are times when you may treat the center designated and not get the result desired. It seems the lesion that affects the center is either above or below the center and must be treated accordingly.
You must not just treat a center then for an effect upon a certain part of the body but find the lesion. Then you work intelligently.
Epistaxis - Stimulate the sup. cervical. Hold the facial artery and the nerves at the inner centers of the eye.

LECTURE 4. - 1.

Landmarks of Back, etc.

It is well to-day before enterin upon the question of how to examine a spine for us to consider the surface form of the back and an outline of some of the bony prominences and origin of spinal nerves.
You must notice this, that on the skeleton where we have prominences and furrows that in the body it is usually reversed. The bony projections on the skeleton are as a rule for the origin and insertion of muscles. The belly of the muscle swells out and fills in the hollows of the body. If the body is wasted from disease or long sickness, then it more nearly conforms to the skeletal

shape. These bony prominences then become the seat of bed-sores.

Landmarks - After Holden:- The Back.

In a muscular man, furrow, median down the spine, or middle of the back, is caused by the prominence of the erector spinae. The lower end of the furrow corresponds with the interval between the spine and the last lumbar and the first sacral vertebrae or to the middle of the sacrum.

The spines of the vertebrae :- In fleshy persons it is sometimes troublesome to find the exact location of the spines, a little friction with the fingers down the back-bone, will cause the spines of the vertebrae to be tipped with red so that they can be easily counted and any deviation from the straight line be easily detected.

The spine of the third dorsal is on a level with the commencment of the spine of the scapula, as also the third intercostal space posteriorly. It is level with the root of the spine of the scapula.

The seventh dorsal is on a level with the inferior angle of the scapula. The spine of the last dorsal is on a level with the head of the last rib.

The trachea bifurcates opposite the spine of the second or the body of the fourth dorsal vertebrae. Anteriorly it is on a level with the junction of the 1st and 2nd pieces of the sternum.

The level of the 3rd intercostal space posteriorly corresponds nearly with the level of the right and left bronchi. The right nearer the posterior wall. There is generally a dimple found at the root of the spine of the scapula, so that if you wish to place your ear on a stethoscope, it would be just on the inner side of this dimple.

The kidney is most accessible to pressure just below the last rib external to the erector spinae. Its upper bord rmay be as high as the 11th dorsal spine or even the 10th. Its lower border may be as low as the 3rd lumbar.

The ilio costal space- the space between the ribs and the upper border of the ilium is very variable. The highest part of the ilium, the crest, is on a level with the 4th lumbar spine. I remember one patient in whom the ilio costal space was nothing as the lower ribs extended below the level of the crest of the ilium. Others may have a space a whole hand breadth in width. This downward extension of the ribs is generally conceded to denote a neurasthenic condition. May there not be cases (in the gentler sex) in which the neurasthenic condition follows the downward extension of the ribs, as it were, a primary instead of a secondary condition.

In the pit of the neck (occipital depression) you may feel the trapezium and the ligamentum unchae. By pressing we detect the forked and prominent spine of the second cervical vertebrae. How about the first?

The spine of the third, fourth and fifth cervical recede anteriorly, and cannot be felt very readily. This permits the free extension of the neck. The sixth and seventh are easily found because of their prominent spines.

The seventh is the vertebrae prominens. A partial bending of the body or back makes the spines of the vertebrae more prominent. Thus you may have a patient sit on a stool or if on a table, let them rest the feet on a chair, lean forward and rest the hands on the knees.

The peculiar vertebrae are the ist, 2nd, 6th and 7th cervical,

12th Dorsal and 5th Lumbar. The first because it has no spine. The second because of its very large bifid. spine. The sixth because of its prominent spine and very prominent anterior tubercle The seventh because of its prominent spine.

The twelfth dorsal spine at this place is found amny times what the osteopath calls a break, that is, a separation of the spines of the 12th dorsal and 1st lumbar vertebrae. Such is the case with the 5th lumbar. I spoke of the 1st vertebrae a few moments ago but did not tell you how to find the tranverse processes of this one. The transverse processes of the atlas can be felt as a rounded nodule of bone, just below and in front of the apex of the mastoid process along the anterior border of the mastoid muscle.

In looking at the skeleton you doubtless have noticed that the 6th cervical vertebrae is the most anterior of any along this part of the colum; If pressure be made in the neck in the course of the common carotid artery (Give course) opposite the cricoid cartilage the prominent anterior tuburcle of the 6th cervical vertebrae can be felt. Here you can effectually compress the carotid artery.

Have a care in treating for hiccough where you are impinging on the phrenic nerve. Not do as one of my class who said he effectually cured the hiccoughs, but the patient fainted. Then he stirred himself to overcome that condition which he surely caused by pressure on the carotids.

We are all conversant with the place of exit of the spinal nerves, so that in this connection it may be well to know opposite what vertebrae the spinal nerves in the different regions arise from the cord. They are as follows - after Holden.

The origin of the eight cervical nerves correspond to the interval between the occiput and the 6th cervical spine.

The origin of the 6 upper dorsal nerves corresponds to the interval between the 4th and 11th dorsal spines.

The origin of the 5th lumbar nerves corresponds to the interval between the 11th and 12th dorsal spines.

The origin of the 5th sacral nerves corresponds to the spines of the last dorsal and the 1st lumbar vertebrae.

Many of the spines of these same vertebrae are useful as landmarks, indicative of the levels of important organs.

These are given after Holden:-

The 5th cervical the beginning of the cricoid cartilage; also the beginning of the oesophagus.

The 7th cervical marks the apex of the lung; higher in the female than in the male. The apex of the lung is most liable to disease and it may be examined at the external end of the clavicle.

The 3rd dorsal is where the aorta reaches the spine. Marks the apex of the lower lobe of the lung. Also the angle of bifurcation of the trachea.

The 4th dorsal is the end of the aortic arch; also marks the upper level of the heart.

The 8th dorsal marks the lower level of the heart; also the central tendon of the diaphragm.

The 9th dorsal the point where the oesophagus and the vena cava pass through the piaphragm; also the upper edge of the spleen.

The 10th dorsal the lower edge of the lung. At this point the liver comes to the surface posteriorly. Marks the cardiac orifice of the stomach.

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The 11th dorsal marks the lower border of the spleen; also the supra venal capside.

The 12th dorsal is the lowest part of the pleura. The height at which the aorta passes through the diaphragm. The pyloric orifice of the stomach.

The ist lumbar, the venal arteries and the pelvis of the kidney.

The 2nd lumbar is the termination of the spinal cord. Marks the level of the pancreas. Duodenum is just below. Also the situation of the receptaculum chyle.

The 3rd lumbar the level of the umbilicus. The lower border of the kidney generally.

The 4th lumbar marks the level of the division of the aorta and the highest part of the crest of the ilium.

The 5th lumbar the level of the formation of the inferior vena cava.

LECTURE 5 - 1.

How to Examine a Spine.

First I think it well to speak of the normal curves of the spine. The normal spine presents four curves. Their names correspond to the different regions of the column, viz, cervical, dorsal or thoracic, lumbar and sacral.

The cervical curve commences at the odontiod procus of the second cervical vertebrae and extends to the second dorsal vertebrae and is concave posteriorly. The second curve, the dorsal, extends from the 2nd dorsal vertebrae to the 12th dorsal vertebrae. It is convex posteriorly. The greatest convexity being about the 7th dorsal vertebrae.

The third curve, the lumbar, extends from the 12th dorsal vertebrae to the lumbo-sacral articulation. The lower vertebrae making the greatest curve. It is concave posteriorly.

The fourth curve, the sacral, commences at the lumbo-sacral articulation and extends to the point of the coccyx. It is convex posteriorly.

In or during foetal life only two curves are developed. The primary curves being the dorsal and pelvic. The other two are developed after birth and are compensatory. Also in most spines there is a slight lateral curvature. This is generally to the right. It is caused by mustular action long continued. As most people are right handed therefore the curve is to the right.

Each operator may and very likely has a way peculiar to himself as to how to examine a spine. I like for the patient to prepare so that I can get next to the skin, along the spinal column. Have the patient sit on the side of the table, feet resting on a stool. Taking the position of which I spoke in the last lecture Look for the lesion always, whether high or low; if above or below the center affected; whether dis-location, subluxation, contracture, congestion or compression, find it. Pass the flattened palm of the hand down along the spinal column and get its general contour, and in this way mark any great irregularities for closer inspection. By the eye or hand or both, find if the spine is deviated laterally. Then notice if the normal antero-posterior curves are increased or diminished in any part of the column. Especially may there be a flattening of the spine near the shoulders. Again, it may be decidedly posterior, as shown in several cases which I treated. This tendency toward a flattening or increasing of normal

curves may be in any part of the column. Again, it may be the whole column, and then all the curves may be increased. Especially may all the normal curves be lessened and in this we have what we designate as a straight spine. This can also destroy the equilibrium of the whole body. See if the lumbo-sacral articulation seems to be too prominent anteriorly. While the sacrum itslef may be too prominent posteriorly, or again, too flat. In this way the antero-posterior diameter of the pelvis may be increased or diminished. The cocyx may be bent to one side or directly forward. Here we should notice if at any point along the spine a vertebrae is deviated laterly. In that case there is generally a soreness on the side toward which the vertebrae is slipped. (My experience to the other side, sometimes on spine itself). There may be one or more thus slipped laterally. We may find one, two or more extending backward. Cases of stomach trouble. Cases of Liver trouble 7,8 & 9 D. Again, one may find them slipped anteriorly. These are sure to cause trouble both to the patient and to th operator. (Case of stomach trouble 5 D. anterior).

In cases of these misplaced vertebrae, either slight or marked, there may be compression by ligaments or other structures on a nerve or blood vessel, thus abridging the functions of the structure compressed. This may be caused by a dragging or tightening of these structures. There may be a separation of the vertebrae, spreading apart of their spines, constituting what we call a break. There may be a condition in which the vertebrae are drawn together, giving a somewhat smoother feeling than the normal condition. This Dr.Hazard designated as a smooth spinal column. In the examination of the spine no displacements may be found. Then examine closely for a strain of a congested muscle, as such a condition is often found to exist. Be sure to examine closely as it may be the deep muscles instead of the superficial ones that are affected. These congestions may be primary or secondary. By a primary congestion I mean one that starts in the muscles, being cause by some direct effect upon them. This may be a draught or blow. Especially do I remember one of my patients who could not sit with his back near a door or window. This seemed to affect the peripheral termination of the nerves, this stimulation or irritation then acted through the spinal nerves and their sympathetic connections, affecting some internal organ and also seemed to affect the terminal sensory filaments.

A secondary congestion is one in which some internal organ or viscus is affected. This may affect one of the great prevertebral plexuses and then it is sent to the spinal nerves , over which the stimulus or irritation is carried by their pirepheral nerves to the skin and muscles of the back.

Having now completed our examination of the back, I have the patient lie on the table and complete the examination of the spine by going over the neck. Notice the position of the occiput and the atlas, the relations they bear to each other. They may be such that one is more posterior than it should be and cause serious trouble(Case of Bob Montgomery. Occiput against atlas). The transverse process of the atlas may be found as stated, just below and in front of the mastoid process of the temporal bone and just back of the angle of the inferior maxillary bone. Thus you see if there is a slip however slight, either laterally, anteriorly or posteriorly, you can readily train your fingers to detect it. The bifid spine of the second is readily found and its position detected. In

some necks it is possible to detect the position of the 3rd,4th,5th cervical spines by flexing the head on the [illegible]. A better plan is to throw the neck laterally, the head being bent to one side, and distinguish their position by thus making the transverse processes prominent first on one side then on the other. If any of these vertebrae are misplaced in any way there is usually a sore spot found at the end of the transverse process of that vertebrae. We should be very thorough in our examination of the neck. It has varied nervous connections and may be the starting point of serious diseases or may be indicative of disease seated there.

Hilton says: No cases of diseased spine are so immediately dangerous to life as those in the upper part of the cervical region especially if situated between the 1st and 2nd cervical vertebrae.

If after a thorough examination we had detected nothing and still thought it possible that disease might be present, Hilton found that on pressing the head directly downward on the spine and attempting to rotate the head upon the spine, a pain in the cervical region will be evidence of disease there."

In examinations or treatments there may be clicking, grating or even popping sounds heard. These may be in any part of the spine or rib articulations to the spine. Possibly you have experienced some such sounds in turning your neck or likely in turning some other person's neck. These all have their significance and we must be able to explain them, which we will do at some future time. This ends our general examination of the entire spinal column.

LECTURE 6 -1

We mentioned the fact that we found lesions at different points along the spine. Then the question: What constitutes a lesion? It is any injury, hurt or would, while in pathology it constitutes any morbid change. In the definition which I gave you in its fullest sense, it means any morbid change intfunction or structure of any organ or tissue.

The examination of the spine completed and the different lesions found, very properly the next question which arises is: What is the explanation of such troubles, of what significance are they to Osteopaths? Unless this query can be answered satisfactorily, the examination will have failed to benefit us, and the patient is no wiser than when he came. We are satisfied that these points can be satisfactorily explained and in our nest lecture we will attempt it.

Osteopathic significance of points found in examination of the spine. What do these lesions lead to the operator? In what manner does he reason them out? What process of thought followed? Dr. Hazzard in his lectures has mentioned that the first point in our process of reasoning is in regard to lesions, and very properly does it come first. We have just defined it. As to where it may occur, at any point along the spine or in its broader sense in any part of the body. It may be slight or severe, of small or large extent, superficial or deep. As a rule the lesion affects the center at or near where it occurs. It may affect sympathetic or cerebro slinal life, either one or both. If the lesion is deep or of any great extent (this of lesions along the spine) it is sure to affect the sympathetic system and thereby organic life. You remem-

ber the very close connection between the cerebro-spinal and the sympathetic system through the sami communicantes. You must remember to keep the two systems separate in your mind. There being symptoms from the cerebro-spinal and the symptoms from the sympathetics. This only to help you in your process of reasoning, as in your practice you do not find them separated. Take a case in point to illustrate as to how a lesion might affect both cerebro-spinal and sympathetic life. A young man with 7th or 8th dorsal misplaced posteriorly. He had pain localized over upper part of abdomen. He was sweating so much that his clothing was kept wet so great was the stimulation to the secretory fibers of the sweat glands. I placed him on the table and succeeded in putting the vertebrae into its proper place the first treatment. The pain and sweating both stopped immediately. How could this be explained? The pain was expressed by the terminal sensory filaments of the 7th or 8th dorsal spinal nerves. The sweating was controlled through the sweat center,- this is given as from 1st to 12th dorsal. Here the lesion was at the 8th D. and affected the secretory fibers of the sweat glands which pass distally from the pale rami, by way of the anterior and posterior primary divisions of the spinal nerves.

The second point is:- The amount of intensity of nerve life displayed in any given condition. To give you an idea of what I mean, I will give you a case to illustrate the point. In some examinations you find congested or contracted muscles along the spine, or again, the thickening of some of the tissues and either condition tends to make the spine rigid, loosing much of its elasticity.

The Osteopath would reason thus, that there was an irritation at some point, this irritation has generated nervous energy, and this nervous energy is distributed and if pain is expressed, affecting the terminal sensory nerves. It is as shown by the condition present, distributed by the terminal motor nerves causing the contractions. In such a case we would expect that there had been a strain or some injury to the spine, causing this generation of nerve force and making it necessary for it to be disseminated. Is it anything improbably for such a state of things to be found, and that the irritation to these fibers produced such an effect? To show that it is nothing improbable I will quote authority to sustain the statement. Gowers says "We speak of cells producing and fibers conducting what is termed nerve energy, but fibers also can produce nerve energy. The stimulation of a fiber is sufficient proof of this." Again Howell says: "The excitation of any part of a nerve cell is capable of producing a nerve impulse, whether the stimulus be applied at the tips of the deudrons or the neuron in its course. (explain neuron and deudrons). Thus the impulse being generated from the strain or injury to the muscles along the spine, we see how it is that the contracture or rigidity is caused by this same strain or injury. There is still another explanation possible. It is this. The strain or injury may have directed too much nerve force to that point, this resulted in drawing an excessive amount of blood to the part, which caused a thickening of the tissue from the excess of food material and thus the spine was bound down by these thickened tissues and rigidity was the result. If this rigidity or contracture was what we called a secondary one, that is, from some visceral trouble, then we would reason thus: For an illustration we will suppose that the kidney was the organ affected. The irritation to the nerves of the kidney would be sent to

the solar plexus, or abdominal brain, as it is sometimes called, there it would be reorganized and sent out over the splanchnics to the spinal nerves, there through these spinal nerves back to their destination, causing the contracture which was found in the muscles

This gives us some idea as to how too much nerve force directed to the spine caused a rigid one. But the very opposite condition may be found to exist, that is a relaxed condition of the spine, which tells us that not enough nerve force or life is present. The fact that the spine was relaxed was sufficient evidence of a lack of nerve force.. Something has happened to deaden or inhibit the action of the nerves. The Osteopath has two conditions here given. In the one case he must adopt such measures as will scatter or disseminate and thereby equalize the nerve force. In the other he must remove the cause of the deadening or inhibition and adopt some means of renewing the nerve force. The third point is the diagnostic value of pain. Pain is expressed through or by means of the sensory nerves. Therefore if a patient complains of paid on any particular part of the body it must be expressed by the nerve there. No other structure can express it. Many times pain is expressed on some part of the body, where, it seems, no cause is readily found to produce it. How is it then explained? Oh it is rheumatism or some sympathetic pain. This is no diagnosis The osteopath must not be satisfied with such an assertion, but must figure out what assocation of nerves will explain the pain. These sympathetic pains are explainable and should be solved every time, and I doubt not but what quite a few of such so called pains would soon be divested of all their mystery if the examining physician would use his brain a little more. Hilton says: "That external pain, or pain upon the surface of the body, may be considered as an external sign of some distant derangement." So that pain in any part of the body (when not associated with an increase of temperature) may be looked upon as caused by an exalted sensitiveness of the nerves of the part, and as a pain dependent upon a cause situated remotely from the part where it is felt. There is an idea prevalent that wherever the pain is felt, there they have an inflamation. There is one distinguishing feature by which you may be able to know if the part is inflamed. That is in the temperature of the part. There may be pain, redness and swelling, but all these would not indicate inflamation unless accompanied by the distinguishing feature, an increase in the temperature or heat. If by placing the hand over or on the part an increase of temperature is noted then an inflamation is present. If no increase in temperature is present, then, it is [illegible], from an exalted sensitiveness of the nerves of the part and dependent upon a cause situated remotely from where it is felt. It is only by tracing the nerves to and from that part that we may hope to arrive at the real cause of the symptoms, as it is only by and through the nerves that pain is expressed, and that a cause must exist for every pain. Therefore there must be some nervous connection (direct or indirect) between the part where the pain is expressed, and the cause of the pain, however remotely situated it may be. This being true, a knowledge of the distribution of the nerves of the body is the very essential thing. The next point is to locate the precise position of the pains. Then is the operator able to select the nerve that expresses the symptom. Somewhere in the course of its distribution between its peripheral termination and its central, spinal or cerebral origin the precise cause of the pain expressed on the surface must

be situated. Thus follow the nerve selected centripetally, bearing in mind its relation to different structures and see if the cause cannot be located. To illustrate, Hilton tells of a case where there was simultaneous occurrence of earache and toothache. The anterior part of the ear and the auditory canal are supplied by the 5th nerve. The teeth are supplied also by the 5th nerve. Thus we can readily explain the associated pain, in this case very likely a bad tooth. Now if the pain had been expressed on the posterior pendulous portion of the ear and in the teeth two causes must then be looked for, and why? Because that portion of the ear is supplied by the great auricular nerve, from the second and third cervical while the pain in the teeth was expressed by the 5th nerve. Thus we see how necessary that the exact distribution of the nerves must be known. Of just as much value to us is the pain even though the cause is some diseased vicus. The reasoning and the nervous connection nust be used to locate the seat of pains thus expressed, as it is a fact that pain on the surface of the body may be associated with a diessed condition of some or any viscus. Some organs have fibers direct from the cerebro-slinal system as well as sympathetic fibers. Then it is possible to locate the trouble through their cerebro-spinal fibers. The other organs have no direct communication with cerebro-spinal system. Then it is the operator must be able to trace the various connections of certain cerebro-spinal nerves with the sympathetic so that the precise cause of the trouble may be located. If certain cerebro spinal fibers express the pain only its connections with sympathetic fibers must be closely watched. The precise cause of the pain is located, then it is possible to give a correct diagnosis of the condition present in the patient. In reasoning in this manner and being able to use every expressed pain at its correct value is found one of the strongest points in the diagnosis of diseased conditions.

LECTURE 7 - 1

Continuance of significance of points found in examination of the spine.

Variations of the normal curves of the spine. They may be indicative of very serious trouble. This flattening between the shoulders, of which we spoke, may indicate heart or lung trouble or both. Especially does it seem to have an effect on the nerves to the lungs and indicate a weakened condition there. There may be sufficient trouble expressed in the upper dorsal region - that is 1st or 2nd rib, to cause heart flutter or palpitation. This condition must be remedied. By the first rib and second also, the clavicle being to close together we sometimes get morbid conditions in the nerve trunks and circulation of the arm. Many times if the ribs are dropped down or drawn together (though this condition may be more readily caused by a posterior curvature) the seat of the pain may be about the 4th, 5th or 6th dorsal region. We may there have mammary or inframammary pain and lead to very severe trouble. This pain as expressed in this region, if on the left side, is what the medical profession call "Angina Pectoris." We are able to relieve such a condition in a very short time generally. We find the trouble in this condition to be expressed by the intercostal nerves and relieving the tension or irritation or both, that is on these nerves stopped the pain. If the pain is situated only two inter costal spaces lower, viz., 6th, 7th and 8th on the left side it may

be indicative of true heart trouble. The explanation of this condition is as follows: The aortic arch impinges on the left side of the 3rd dorsal vertebrae. As it passes downward it receives fibers from the 4th, 5th and 6th ganglia of the sympathetic. These fibers are distributed to the heart. These sympathetic ganglia are directly connected with the 4th, 5th and 6th intercostal spaces. Thus you see the close connection between the heart and these intercostal spaces. Then the question: Why does the pain appear to be at the 6th, 7th and 8th intercostal spaces? It is because these three nerves give off large lateral cutaneous branches which descend over two ribs before terminating in the skin of the intercostal spaces.

We may find asmetic troubles expressed as low down as the 7th dorsal, while I remember one patient in whom the wheezing was stopped at the 12th dorsal. If this flattening extends as low as the 8th dorsal there is likely to be stomach trouble, kidney trouble and sciatica have been caused by a lesion as high as the 2nd dorsal. On account of the venal center in the medulla a lesion at the 1st and 2nd cervical may change the character of the urine. There is also a condition which must be mentioned in this connection, that is, pain expressed at the tip of the shoulder. This is the case in liver trouble. It can be traced very likely to the various connections of the vagus and spinal accessory nerves especially as the pain seems many times to be just in the edge of the trapezius muscle. The phrenic nerves send twigs to the porta of the liver. Another explanation may be the phrenic and its connection, 3rd and 4th cervical nerves, or the nerves to the subclavius (explain). There may be pains located between the shoulders or over the inferior angle of the scapula. This may be and generally is indicative of disease of the following viscera: Stomach, duodenum, liver and pancreas. This pain is exprssed by the sensory terminations of some of the spinal nerves. What nerves occupy this position? The 3rd, 4th, 5th and 6th dorsal nerves. These nerves are distributed over the inferior angle of the scapula and the interscapular space. Therefore they are the seat of pain. These viscera are supplied by the great splanchnic nerve. This nerve passes upward from these viscera, its origin being from the 5th dorsal to the 10th with a connection very likely with all the dorsal ganglia above the 5th. There is a very close connection between the sympathetic and these 4th, 5th and 6th dorsal spinal nerves which give the sensory filaments of the skin. We know this is the way this association of pain and visceral trouble are explained, although we may not know just how the transmission is made. Thus we see hom pain expressed between the shoulders or over the inferior angle of the scabula by the 4th, 5th and 6th spinal nerves may indicate disease of these viscera. If these abnormal curves extend from the shoulders to the lumbar region, it generally affects the intestines and the kidneys. In this instance if the lesion is such as to affect the region from the 10th to the 12th dorsal, it will likely cause a diarrhoea. Why? Because it excites and irritates both of the sympathetics situated in the walls of the intestines. This over stimulation causes them to do more than the normal amount of work. The first plexux, Auerbach's, controls the motion of the intestines, therefore it causes an increased peristaltic action. The second plexus, Meissuer's, controls the secretions. An over stimulation causes an excess of watery secretion and both together give a very marked case of diarrhoea.

The lesion of which we spoke catches the splanchnics which pass to these organs. Thus you see the osteopathic way of reasoning. It is the same with regard to centers. Therefore if any lesion or abnormality is sufficient to affect a center, the part of the body which that center governs, is sure to be affected. The lumbo-sacral articulation may be the seat of an important lesion. Especially in a rickety spine may this articulation extend forward and downward so that the antero-posterior diameter of the pelvis is very materially shortened. This is of grave importance in women as it may present a barrier to child-birth. This is the point or center affecting the hypogastric plexus. This plexus supplies all the pelvic viscera, so that very much tenderness or soreness in this region indicates uterive trouble. But from the symptoms and a thorough examination we are able to differentiate uterine trouble from troubles of the other pelvic viscera. A lesion at this articulation may affect the generative organs of either sex. There may be a slip or a dislocation sufficient to cause paralysis. Again it may be only sufficient to produce paresis. (Case of Standage boy - Clarinda) Again it may only result in Sciatica. Generally though a posterior tendency in the lumbar region results in sciatica more times than the lesion at the lumbo-sacral articulation.

The coccyx in its misplacements is a great source of nervous irritation. The hypogastric plexux and the many plexuses that spring from it supplying the pelvic viscera, are all bound to suffer from this nervous irritation. This sympathetic trouble may cause a diseased condition of the pelvic viscera or it may be more extensive and affect the whole body. Aside from this being the source of sympathetic trouble it may be the cause of piles and constipation by mechanical obstruction. The condition, when the spine is found to be too rigid, is that from some strain, injury or some primary or secondary contracture. Too much nerve force has been sent to the spinal column. In this case most of the centers along the spinal column are found to be affected. The same is true where we have what we called a smooth spinal column as there are contracted ligaments and approximated spines., thus some of the following named troubles are found to be present.

Nervous: Eye or circulatory troubles accompanied by nutritional disorders. The centers affected most are those where the condition of the spine seems the worst. There is the opposite condition of the spine, that is, too mobile or a weakened condition which shows a lack of nerve force. Then we may find neurasthenic and nutritional disorders present.

Misplaced Vertebrae: Vertebrae may be misplaced anteriorly, posteriorly or laterally. These misplacements may occur in any part of the column. According to the situation of these lesions are we able to select the centers affected. It is the osteopath's businessto know the function of the centers affected. Then the extent and results of these lesions can in some degree be estimated. In connection with a twisted or misplaced vertebrae, the tension on the ligaments must be noted. In these articulations there are seven different ligaments concerned(two of a kind named in some) In such conditions these are all put on the stretch, or a tension, and the result is that the nerve may be irritated or nerve force entirely shut off. These ligaments may compress the nerves or other structures and in this way affect centers also. At any rate we are generally able to select the nerves exprrssing the cause of the trouble. In such cases we reason from the cause found to ef-

fect which we may locate especially so with the help of the chain of symptoms which we may get from the patient. The peculiar vertebrae may be misplaced. We will speak of the atlas later. The normal condition of the spine must be familiar to the beginning osteopath else when he examines the neck and finds the prominent spine of the 7th and forked prominent spine of the 2nd cervical, he may announce a bad misplacement and be brought to grief by such a blunder. The 12th dorsal may be separated from the 1st lumbar, causing a break at that point. The lesion may be only sufficient to cause intestinal or kidney trouble. Again it may be so marked as to cause paresis or paralysis. The effect that a break at the 11th dorsal has on menstrual troubles must not be forgotten. The 5th lumbar misplacements and its effects have been mentioned.

These are some of the lesions found along the spine and their significance to the osteopath.

At the next lecture we will continue on the result of other lesions.

LECTURE 8 - 1

Further consideration of points found in the examination of the spine. A strain or injury may result in a contracted or congested muscle. These may occur at any point along the spine and we judge of their effects by the location of such contracture or congestion. If such a lesion is of a secondary nature it will be found situated in such a place as will give the best nervous connection with the cerebro-spinal system. As these excesses of nervous energy seem to take the direction of least resistance, or as they express it, in the best beaten path. (Actions along course of nerves, if changed, learn anew right and left handed). Centers are affected the same as if a primary condition existed, that is, I mean in like manner. Therefore according to the viscus affected, we find the center affected, showing itself in the contracture which is expressed in the muscles or ligaments by the terminals of the cerebro-spinal system. Therefore these contractures may lead to numerous difficulties or be the result of disorders in different organs or viscera.

We will now consider the position of the atlas with regard to the occiput. This is of great importance to the osteopath. It may be misplaced in most any direction so as to cause nervous irritation or inhibition, or it may affect spinal centers.

1st. If it mechanically shuts off the blood supply to the brain, or if it be only partially so, it will cause headache and nutritional disturbances in the brain. In this way it may affect the whole brain, that is, all the centers and thereby the whole body. These troubles may not be limited to the brain but may extend to the cord and through its blood supply affect the nutrition of the cord and causing various spinal troubles. If the impingement is severe enough the pressure will cause hemiplegia and there are cases where complete paralysis has resulted from an injury at this point, while I remember a case of both upper and lower limbs affected by a fall, resulting in an injury in the cervical and upper dorsal region. While some injuries in this region are only sufficient to cause non-development in some parts of the body. Others are affected in the hearing, even causing a discharge from the ear. It may produce dumbness in the patient because of the effect on the hypoglossal nerve. There are cases on record in which trouble at this point has caused insanity. A correction of

the lesion cured the patient. (A case of a little child three years old fell and misplaced 1st and 2nd cervical vertebrae; it was nearly dead when the father replaced these vertebrae and it got all right in a short time). Many times neuralgia, toothache and earache are the result of trouble here. This articulation is of vast importance to the osteopath and should be closely examined for eye troubles and eczema. I have seen cases in which a stiff neck and head-ache resulted from a slip and fall or, if no fall, in just giving a jerk to the cervical region, this being sufficient to cause the trouble. Thus we can not but be sure that any cervical trouble may be of great danger. Hilton states that troubles in the cervical region at the 1st and 2nd are the most immediately danger-

In this region there are two plexuses that may be affected. The first is the cervical plexus, consisting of the first four cervical nerves. This plexus may be affected by spasms, convulsions or paralysis. Misplacement of any of these vertebrae, growths on this part of the neck or exostoses may bring about such troubles. There is a very close connection in this region with the vagi nerves and lesions here are likely to affect these nerves.

The distribution of these cervical nerves is to the side and back part of head, part of ear and face and anterior two-thirds of neck, upper part of chest and shoulders. I spoke of the connection of these nerves and the 10th or vagus. They also connect with the 11th and 12th nerves and the sympathetic. In addition to the diseases mentioned there may be torticollis, neuralgia and hiccough. You remember here is where we reach the phrenic nerve near its origin, which controls diaphragmatic troubles. By knowing the distribution of these nerves, if pain is expressed by any of them, we are soon able to locate the cause. To illustrate from Hilton: A case where the patient complained of earache; the pain was located on the lower part of the ear lobe; on the neck a slight swelling was located, close to the second cervical nerve. This swelling was caused to suppurate and consequently disappeared, when the pain made its disappearance also. He was able to know where to look for the cause by knowing the distribution and origin of the nerve that expressed the pain which was from the 2nd and 3rd cervical. Then he followed the nerve centrally and found the cause, showing how readily our method of reasoning will lead us to the proper solution of such cases.

The second one is the brachial plexus. This consists of the four lower cervical nerves and the greater part of the first dorsal The first plexux connects with the upper cervical ganglion of the sympathetic. The brachial plexus connects with the middle and lower cervical ganglions of the sympathetic and must be in close communication with the first thoracic ganglion, or what is called the stellate ganglion. Thus we see that misplacements in this region, growths or exostoses may easily be severe enought to affect sympathetic life and cause serious disturbances, far reaching in their effects.

The vertebrae prominens (7th C.) would, if misplaced, produce a direct effect on these nerves. The causes affecting this plexus are those mentioned, misplaced vertebrae, growths and exostoses and in addition a fracture of bones, inflamations or callosities from a fracture or a dislocation of the shoulder. A sudden wrench or injury to the arm has a like effect. The disprders which may fol-

low such lesions are paralysis, palsies, spasms, neuralgia and neuritis, also nutritional disturbances may accompany them. These nerves are distributed to the arms, to some of the muscles and to the skin of the chest wall, both anteriorly and posteriorly. To show you how necessary to know the precise distribution of this plexus, especially the different divisions, I will give you a case from Hilton in which there was gangrene of part of the hand. A woman came to the hospital, the arm somewhat mottled, the 3rd and 4th fingers gangrenous to the second joint. In this case he could readily select the ulnar nerve as the seat of the disorder. The next step is to follow it centrally. On the first rib was found an exostosis; this extended pressure on the origin of some of the fibers of the ulnar nerve and gave him the seat of the lesion. If it had been circulatory disturbance the whole hand and arm would have been affected alike, as the pressure would have been on the sub-clavian artery. (Note our method of reasoning).. The third group of nerves along the spine arein the dorsal region. These nerves do not form a plexus but extend outward between the ribs. They are connected with the sympathetic dorsal ganglia and disorders such as sensory afflictions or neuralgia are found associated with lesions in this region. I have spoken to you of Angina Pectoris. We generally find it to be an intercostal neuralgia, resulting from a dropping or drawing together of the ribs, causing an impingement on the intercostal nerves. Pain expressed by these dorsal nerves may be indicative of disease of some of the viscero connected with the splanchnic nerves or of the pleura or lungs. Dr. Haxzard mentions one point not to be forgotten in connection with these nerves. It is that lesions in this region may cause "Herpes Zoster", commonly called shingles. This is a nervous affection accompanied by eruptions on the skin. The third plexus is the lumbar. Lesions affecting this plexus are by misplaced or diseased vertrbrae, meningitis and neuritis, also psoas abscesses or growths in the abdomen. These morbid conditions may cause neuralgia, spasms and paralysis. These nerves are connected with the lumbar sympathetic ganglia. Thus pelvic troubles may be indicated by contractures in this region. (There is a close connection through hypogastric plexus).

There are a number of centers to be affected in this region and by the means of these centers we are able to locate the trouble The forth plexux mentioned is the sacral. The lesions of this plexus are generally from growths in the pelvis, neuritis, pelvic compression and inflamation from or during parturition. The resulting disorders may be spasms, paralysis and neuralgia. Sciatica may be caused by a wound, disease of bone, morbid growth, or dislocated hip. Misplacement of the coccyx may be a source of irritation to the nerves in this region. Injury to the dorsal group of nerves or the different plexusescause most spinal troubles, for it is a fact that most spinal troubles start from a strain or injury. The lesion may be slight but permanently affect a part. The patient may even forget that he ever strained or injured the part in any way. Thus it is that the osteopath recognizes that the ill effects of injuries are not always dependent upon their extent. A case in point: A man got a sudden jerk, throwing him backward, striking his back about the middle dorsal region on a wagon box. It pained him some at the time but passed away in a short time. Six years afterwards he comes to an osteopath and is examined. A lesion was found there which seemed to have been caused by a blow

or fall on some object. Such was stated to him. He denied ever being hurt. In a couple of weeks, possibly a month, it came to his mind of the injury mentioned. Thus you see that a lesion of comparatively small extent, forgotten in a day or so, continues to multiply its effects as years go by and then show very serious results. Again, it seems that a misplacement of an inch may cause worse symptoms than a slip of a fourth of an inch or more. The one that is so located as to cause the most irritation or inhibition seems to produce the greatest trouble.

LECTURE 9 - 1.

Further points in osteopathic diagnosis. In paralysis, many times where there is a loss of both motion and sensation, there may be, and frequently is found a hypersensitive or hyperasthetic condition of the nerves just above those paralyzed. An operator, finding such a condition in a patient is sure to be questioned as to the cause of it. There are two explanations ofthis condition

(a) The injury to the column is sufficient to shut off all nerve life below the point of fracture. Just above the point there is very slight sensation, while just above this there is the hyperaesthetic condition. At a point just above the injury there would be an existing inflamation. This is brought on by the injury drawing an excess of blood to the part. This causes an excitation of the nerves springing from that part of the cord, hence the cause of the exalted sensitiveness of the nerves of the body.. Sometimes the exalted sensitiveness of the nerves may be immediately after an injury; then there is no time for an inflamation to supervene. Another explanation would then be necessary.

(b) The lower on the cord we go the grrater distance the nerves travel in the canal before emerging. So that the nerves in the lower dorsal region travel from 1 1/2 to 1 3/4 inches in the canal before emerging. Hence an injury to the cord in this region would impinge on nerves that spring from the cord higher up. The result would be an irritation to these nerves, causing the hyperaesthetic condition of the body.

The clicking, snapping or popping sounds heard along the spine: These sounds may not be indicative of any trouble, while in some instances it may be a symptom of a serious condition. Along the dorsal region these sounds may be elicited on pressure where no diseased condition exists, although there may be a slip or tension in the articulation. Again it may signify that the heads or tubercles of the ribs were not exactly true or that the position of same of the vertebrae was changed. This condition may produce a tension on the ligaments, thus being a source of nervous irritation. This would likely cause an increased amount of blood to be thrown to the part, and this increase of food material would cause a thickening of the ligaments. It must be remembered that many of the articulations are susceptible to slight changes, as the ligaments may allow a slight shortened or lengthened condition and a strain or twist could produce such a result.

A click in the neck may tell us that the blood supply has been partially shut off. This may be caused by a slip or misplacement of tension or congestion which has reacted by the contracture present. The clicking may thus be indicative of a lack of blood supply, thereby depriving the articulation of the proper amount of

lubricating material, hence this grating or clicking sound elicited on movement. The blood supply may be affected in another way, that is, strains or injuries may affect the cervical vaso-motor nerves. This would result in constriction of the arterial walls, thereby depriving the articulation of the proper blood supply. These strains or injuries may in many instances change the position of the vertebrae and be the cause of the clicking. There may be a diseased condition of the vertebrae and movement would then elicit a grating or clicking sound. These strains or injuries are may times the beginning of spinal trouble or curvature, which may be primarily caused by a diseased condition of the vertebrae. The explanation is this: The diseased condition generally begins at the junction of the vertebrae and the intervertebral substance. The reason of this is that the weakest spot in the place of junction of a more with a less elastic body. Hence it is at the junction of the body and the intervertebral substance that the full effects of the strain or injury would be felt. (Explain tear apart or bruise, etc.) To explain more fully that this is the point of weakness, we may take the case of an atheromatous artery on which there may develop an aneurism. The junction of the atheromatous and the healthy tissue is the weakest spot, because the sudden diminution of elasticity makes the artery unable to bear the strain at that point. (Hence the aneurism.) This may likely make it plain as to the junction of the vertebrae and the intervertebral substance.

Third, we have been speaking of centers and the effect on them caused by lesions. Soon we will be asking how the osteopath is able to affect these centers, hence it may be well for us to understand what we mean by the term centers. A center is generally understood to mean an aggregation of nerve cells so related to each other as to subserve a certain function. These cells give off various processes which come in relation with processes from other cells. These form numerous combinations and in this way innumerable paths are opened for nervous impulses to travel. Certain paths seem to be used for certain actions, that is, certain impulses have a certain path to or from the brain or centers in which they travel. These then become the paths of least resistance. Hence when excessive nervous energy is generated in any part of the body it is sent off or shifted onto these paths and thence to certain organs of the body. (The place of the effect, according to organs affected. As I explained in the last lecture, different sides of the brain and body)

A general treatment of the spine: We have examined the spine and considered the significance to the osteopath of points found in the examination. Now the point is, how to treat the spine itself. We shall not consider today the effects we may get on viscera by treating centers along the spine. Our work will be more as to how to relax the spine if contracted or stimulate it if too weak or mobile. It must be our aim to always make a correct diagnosis by going back to the original cause and not depending upon symptoms alone. There are three points to which I wish to call your attention before beginning work on the spine.

1st. Do not treat too hard. In rough treatments delicate parts may be injured. If you are attempting to relax structures or remove contractures, the harsh treatment will very likely cause a stimulation and make the condition worse.

lation and make the condition worse
"nd. Never use the tips of the fingers and dig when giving a treat-
ment. Place the fingers so they are flat and the cushioned parts
are on the structure you are treating and doing the work.. In this
manner you can remove congestions and relax contractures.
3rd. When examining a patient how are we able to say for a certain-
ty that the contractures or hardness of the muscles are not normal
or from exercise? When from exercise the hardness is evenly dis-
tributed on homogeneous. While if the hardness or contractures are
uneven they slip under the fingers and have the feeling of welts.
Very likely then as we educate our brain the fingers can be edu-
cated to keep pace with the knowledge. If we wish to strengthen
the spine itself we must give such a treatment as will reach the
vaso-motor nerves. We relax all structures and give or allow
sufficient nurtiment to be sent to the spine. Remembe r the state-
ment that was given toyou a few days ago, that the branch from the
gray rami, accompanying the recurrent spinal branch is the nerve
supplying the blood-vessels, ligaments, etc , and it is the one
which we must influence. Lay the patient on the side, get the
patient relaxed. You know that is something hard to do. And in
our work along the spine to release contractures, it is always best
to work against the course of the muscle. It is much easier to
get a relaxation. Beginning at or between the shoulders, the
elbows of the patient against you as a lever, you can get the
desired effect. Work down the spine in this way. Another way is
to place one arm against the shoulders of the patient, the other
at the upper part of innominata bone, this gives a good leverage
to spring the spine. may use the arm of patient and palm of your
hand against the angle of the ribs. Again draw the limbs up, work
on same side of the spine, then reach over the spine of the verte-
brae, spring them upward; turn the patient over and work on the
other side. While you have the patient in this position a good way
to stretch the spine is to bend up and down over on the neck and
head as if stretching the ligamentum nuchae. The effect of all
this, the result to be obtained is to strengthen the spinal column
by relaxing contracted structures or stimulating weak and flabby
muscles.

LECTURES 11,13 and 13.

How to treat a spinal column: At the close of the last lect-
ure we began on the general treatment of the spine, to-day we will
continue and maybe complete it. Last time I showed you how to get
a general relaxation or to give a general stimulation. To-day I
will give you two more ways to effect the same results. 1st Lay
the patient on the face, put one hand on ant. sup. spine of ilium
(about causing a rupture) with the palm of the other hand exert
pressure on the angles of ribs and stretch muscles. 2nd. By get-
ting over the patient so exert even pressure on each side of the
spine, preferably stand on a stool or chair.
All of you are familiar as to the use of centers as a means
of diagnosis. First I gave you centers controling certain parts
of the body. Then examples of internal visera diseased which by
means of connection with cerebro-spinal nerves caused contractures
on the surface of the body. In this way we are able to diagnose

stomach, lung and kidney troubles as well as pelvic troubles.

When we find tension or contraction at a center we know there is nervous irritation. This will affect the nerves from this region, and the intimate connection with the sympathetics causes the results found in the internal visera or visa versa. There are at least two ways of detecting that a center is affected. ist. Soreness or sore spots in the region. 2nd. Tension or contracture which we find. These help us locate the lesion. In our examination we find a separation of vertebrae. It may be from an injury or strain; a misplacement which must be overcome. If not, it is the result of an inefficient blood supply or lack of nerve force. There is a lack of tone, causing a weakening of the structures, hence a pulling apart or separation of the vertebrae. How do we treat such a case? Work both sides of the spine as I have shown you, springing the spines so as to give a good stimulating treatment. It is well to stretch the spine and get the rebound. Just as we increase the tone of the structures, muscles and ligaments along the spine these vertebrae come together. This is necessarily slow Get arm against shoulders and elbow on innominata spreading. We may have just the opposite condition present, that is, the closeness of vertebrae or may be all along the spinal column. It may be the result of a strain or injury. The injury is the cause of nervous irritation, then too much life is present, that is, too much nerve force and too much blood. This excess of food material causes a thickening of the structures, the ligaments, muscles, etc., and is the means of producing contractures, thus binding the spines too close together . In this case give the relaxing loosening treatment I have shown you. You must spring the spine well. Bring up the knees and leverage on the lumbar region, also between the shoulders. Stretch the ligamentum nuchae well. Put patient on face and relax structures. I think I told you such lesions were generally accompanied by eye, circulatory, nervous and nutritional troubles. Is stretching the neck for this condition do not twist while exerting much traction, it is dangerous.. Sometimes rheumatism is the cause of this misdirected energy Get the patient on the back,have an assistant to help you, put ends of fingers on side of spines; knuckles on the table. This gives you the leverage, then raise limbs flexing the body, a hard treatment to give, but a good one. By placing the patient on a stool there are three different moves we can use. 1st. Stand on side in front, reach around the patient so, press upward, throwing their bodies slightly backward giving someting of a rotary motion or a twist. 2nd. Get behind the patient, put knee on the sacrum, a hand on each anterior superior spine of the ilium and pull backward. 3rd. An assistant to help, let him take the arms of the patient move them up, back, around and downward, repeat while the operator exerts pressure on each side of the spine with the thumbs.

We may now speak of single vertebrae misplaced. First suppose there is one lateral in this dorsal region. There is very likely a contracted condition of the ligaments and muscles, soreness as I stated in a previous lecture, may be on either side or th end of the spinous process. How do we treat this? Work as I have shown you to remove contractures, of course the work is more localized, but should extend some below an. above the lesion. Spring the spine well to get an effect on these seven ligaments at the articulations. Best to exaggerate the condition, hold against the

spine and work in the opposite direction, at the same time straight ening the spine. It is well sometimes to give a turn with the motion. Sometimes well to get an assistant to exert pressure on th the spine when you give the exaggerated motion with a twist and turn. The question is when to reduce the lesion. If a recent one it may be reduced immediately or before many days. If of long standing, not until some time has elapsed. The treatment must loosen the structures. The blood and nerve forces must be equal- ized in order to get a normal activity to these parts. When a spine is posterior we can sometimes exert direct pressure and re- duce the lesion. Many times it is necessary to use the same moves that we did to loosen all the structures or in relaxing the spine. Then place the patient on a stool, exaggerate, rotate and get the elastic rebound. Sometimes we can best do this by reaching around the patient, exerting pressure on spine and giving a rotary motion. When we find a spine anterior we generally find it difficult to handle as soon as we like.. We generally have to release the structures, strengthen the muscles and draw it back by or with the muscles. Many times when a spine is anterior in the mid or upper dorsal region we can put the knee in the back, a pillow between knee and back and then pull back on the ribs, making the heads of the ribs exert pressure against the vertebrae. Sometimes with a lifting rotary motion assisted by the exaggerated condition to get the elastic recoil, we can do good. I have told you how to handle a spine, both when posterior and anterior. Now I will speak of the fifth lumbar. You will find one more way of handling this when it is anterior. Flex the limbs, then by direct pulling on the muscles we make it come out. There is generally soreness here. watch especially the synchondroses, sacro-illiac. It is many times ne- cessary to work directly on them. Work this up thoroughly but not too hard, and thus remove the soreness. All the curves of the spine may be abnormal. Either too prominent or too flattened. If too prominent the spines are very likely to be too far apart, sep- arated. I have given you the treatment for separated spines. Also how you may relax the ligaments. A good way to do is to get the patient on the face and exert pressure along the whole spine.

There is one treatment called a figure of eight move you can give when the lumbar region is too posterior. (Explainit) This is very beneficial in cases of menolipsis and amenorrhea. It is also good for diarrhoea and flux. The operator must be very car e- ful in giving this treatment, as he may injure the patient if too rough. Explain about pronounced curve in dorsal region. When the spine is too straight and the vertebrae approximated I have told you how to release all contractures, stretch the spine and separ- ate the vertebrae. Relaxing ligaments and muscles. When stretch- ing the spine if the neck seems as if a rein pulling it back, the ligamentum nuchae must be stretched.

The sacrum may be too anterior or again too posterior. When too posterior loosen all the muscles and ligaments, work out the soreness and exert direct pressure on the sacrum. Two ways. (ex- plain) Spring the sacro illia articulations, the treatment I gave you to stop flooding. If it is too anterior we have to do most of our work through the muscles. We might use pressure to approximate the inominata bones and do some good. A posterior treatment simil- ar to the one I gave you for contractures caused by rheumatism in lumbar regions, only go down on the sacrum, giving upward, down- ward and outward motion to the limbs.

ward and outward motion to the limbs.

I gave you the position of the coccyx is likely to occupy. The first thing to be done is to loosen all the structures externally, then give a digital treatment, smooth out all the structures, pressing over front of sacrum and loosening the nerves. In this way remember the normal curves. I think Holden gives them to you. If a recent misplacement there is not very much trouble. If chronic and of long standing then it yields very slowly and gives the patient considerable pain when you are treating. Many times the scapula seems to be set too solidly to the body and too near the spinal column. You remember some of the neck nuscles and the rhomboidei are the ones that set it so. Put patient on back, arm to side, put out your hands over the scapula and beyond it so that the fingers come on the muscles between the scapula and the spine. Draw the arm up and across the chest. This will effectually stretch the rhomboidei. Put the fingers on the muscles at the top of the scapula and raising the arm up will stretch them. A good way to stretch the scaleni is to put one hand on the muscles along the side of the neck and draw the head to the opposite side.

To stretch the Psoas muscle, if the patient is on the back, straighten the leg and bow the back. If on the face you can place the hand on the lumbar region and raise the limbs not too hard. You must remember the lumbar plexus is found in this muscle and contractures there irritate this plexus. There is sometimes a condition of acute hyperaesthesia present and this must be overcome before we can hope to do very good treatment on the patientt. There are two places to treat for this condition. First in the cervical enlargement of the cord. (tell where). Second, in the lunbar enlargement of the cord. (tell where). I have had only one or two cases of this kind and they yielded very nicely.

This closes our general treatments of the spine, yet we will consider certain specific treatments at some future lectures.

LECTURE 13 - 1

Can the osteopath control the blood and nerve forces of the body, if so, how? We have examined the spine and found lesions or abnormalties which I have shown you how to remove or reduce. We were shown the effects of the blood on cell life, hence affecting the whole body. Also that the blood vessels were controlled by the nerves. During these lectures, in presenting these truths, it was necessary to use the terms stimulation and inhibition. At this time we must consider the meaning of these terms. The physiologist uses these terms in speaking of his experiments. The osteopath uses them in speaking of his work and the effects he produces. Hence it is necessary to define these terms first from a physiological point of view. Stimulation means producing a function or increasin an action or function. The first part, producing a function, can be explained or illustrated in this manner: A person wills to do an act, an impulse is started in the brain by or through the cerebral centers, these centers being stimulated by our desire to do. The effect of this generated impulse will result in function or action. The word is used in a second sense and one with which we will deal mostly, that is, an irritation to nerves and centers. To illustrate, the finger is cut or mashed, even if only slightly. This acts as a stimulant to the sensory or afferent nerves, the impulse thus generated is then reflected or turned back

on an efferent nerve or nerves and results in motion. Here it is a reflex process. We will give further illustrations of this in the future.

The term inhibition is defined physiologically as stopping or checking of a function. This inhibition may be brought about reflexly, that is, by an external shock. I gave you an example of this. (Corbett and Fitsimmons).. It may also be produced by an action directly on a nerve, or voluntarily when the will controls an action commonly performed automatically. (An example, winking) Define Automatic action.

It now remains to be seen what the Osteopath means when he speaks of stimulation and inhibition and to note if he uses them similarly to the physiologist. When the osteopath says he has stimulated certain parts, he means he has started an action or increased a function or action of some part of the body by an effect on the nerves to the part. We will see afterward if he produced the effect on the nerves to the part similarly to the physiologist.

By inhibition the osteopath means that he has stopped or checked the function or action of the part or decreased the conduction of nervous impulses.

From the foregoing it is seen that the osteopath and the physiologist are at one in regard to meaning, when using the terms stimulation and inhibition. It remains to be seen if he is entitled to use them in the same sense. In order to satisfy our minds on this point we must investigate and bring them into comparison with the methods used by each and the results produced.

The physiologist speaks of four kinds of stimuli (Name them) I will now give you examples of the different stimuli which he uses and what he considers the result of all or any one. 1st. If a nerve be cut, pinched, suddenly stretched or given a blow or tap the result is a stimulation. The stimulus produces a nervous impulse, which, if on a motor nerve, results in a contraction. 2nd. If some chemical, as an acid, be put on a nerve, it will result in a contraction. If on a motor nerve it may cause pain,, showing that sensory nerves are stimulated, and thereby a nervous impulse is generated. 3rd. If heat is applied, a burning match or something similar, the rapidly heated nerve fibers develop impulses that stimulate the nerves to action. 4th. An electric current may be applied to the structures and every time the potential is changed the result is a stimulation. Kirke in speaking of this stimuli says: In every case, by all these methods, the nerve was excited by iritants applied from without and the muscle was excited to action by the physiological stimulus coming to it from the excited nerve. Thus we find that physiologists say that stimuli applied externally generate nervous impulses which cause an action of the part so stimulated and that this is said to be a physiological stimulus. The authorities regard stimuli as liberators of energy, or a stimulus as added motion.

Having thus shown you how these stimuli are applied and that their result is a physiological stimulus, we must notice their effect on the body, especially of mechanical forms. We will quote the authorities as to the effect of these stimuli and their manner of production.

It must first be noted that gradually applied pressure may paralize the nerve without exciting it. Stretching a nerve may lessen its conductivity, as this is only another way of applying

pressure. Again a slight tap may cause a stimulation. Slight st stretching heightens the excitability. (acts as an irritant). A sudden blow, pinch, twist or cut excites a nerve or muscle. There is a verification of this both by Howells and Gowers' They say all have experience the effect of mechanical stimulation on a sensory nerve, a blow on the crazy bone, that is, the accidental or premeditated blow on the ulnar nerve where it passes over the elbow. There are other instances in which the usefulness of the sensory nerves may be demonstrated. The blood vessels have contractile walls and contract when mechanically stimulated. This mechanical stimulation can act or be applied in two ways. First, directly. Second, reflexly, through the agency of a sensory apparatus. Thus you see these reflexes are commonly produced by the stimulation of sensory nerves and not those contained in the vessel wall. The sciatic nerve and the region it supplies is an instance of this kind. If it be cut there is a rise in arterial pressure and a swelling of the leg. How and why? The cut stimulates the sensory nerves and this impulse stimulates the vasomotor center in the medulla. The effect on the region is dilation for the purpose affording food for repair while arterial pressure is raised by the general construction of the vessel walls in other parts of the body. This is produced by mechanical means.

A low temperature or a high one may produce marked effects. Notice when exposed to a low temperature the skin vessels are n contracted, causing it to be pale, if a high temperature there is a dilation of the skin vessels and the consequent readiness of redness.. The authorities tell us that this is not brought about by a direct action of these influences on the skin, but by the sensory impulses which are generated. These pass to the central nervous system which in the first case causes constriction while in the second dilation. This is a reflex process. Many times there may be an abnormal sensitiveness of the vaso motor nerves. This condition is found to exist in such diseases as angio neuroses of the skin, seemingly of individual vaso-motor nerves. In this case a stimulation just of drawing the finger nail across the affected part will result in an immediate wheal or welt. This must result in a local cutaneous arterio spasm. You ask why the use of bringing to your minds a view of all these cases. It is for the purpose of showing you the results the physiologist gets on the nerves of the body affecting nerves or muscles or both. How he controls the circulation or at least affects the circulation of different parts of the body. These results are all accomplished by mechanical stimulation, with the exception of one.

LECTURE 14 - 1

Theory of Osteopathic control of blood and nerve forces of the body continued:

There are a few points in regard to stimulation which I wish to bring before you. First, the effect of mechanical stimulation of nerve endings in muscle. The nerves going to muscles are mixed nerves. If there is a mechanical stimulation of these nerves there is a fall of blood pressure produced reflexly. Unless the area is of great extent the fall of blood pressure is not of very great extent. The cause of the fall of blood pressure is that the impulse generated in the muscle is carried to the bulbar vaso motor center and there it diminishes the constrictor impulses and

dilation and a fall of blood pressure is obtained. It must be that the same thing is obtained when a muscle is at work. Why? We know that the greater the amount of work a muscle perfoms the greater its blood supply. It would seem then that the working muscle acts as a mechanical stimulant to its nerves and in this manner dilation and decrease in blood pressure is obtained. This is another way in which the sensory nerves play an important part in governing the life forces of the body for it is through them that these dilator impulses are brought about or an impulse acting as an inhibitor of constrictor impulses which are constantly in action.

The effect of the splanchnic nerves on the blood supply: There can be far reaching results from these as they control a great amount of blood supply in the internal organs and reflexly affect other parts. This of course is through vaso-motor influence either dilation or constriction. It is possible for the vessels of this splanchnic region to hold nearly all the blood of the body. The if from some influence there is an abnormal stimulation of the dilator fibers which leads to great dilatation it is possible for a person to bleed to death in their own belly. So say Landoi & Stirling.

It is known that the stimulation of the splanchnic area will cause a rise in blood pressure and consequemtly a greater peripheral resistance for the heart to overcome. While if the constrictor impulses are inhibited there will be a dilatation of the vessels of this area and consequently a fall in blood pressure. Also a lessened peripheral resistance for the heart to overcome. Note the following. There is a depressor nerve in the heart which can be stimulated by one or both of the following conditions. 1st When the heart is over filled by an excessive venous inflow. The impulse generated from such causes is carried to the bulbar vaso-motor center and the result is that the normal contrictor impulses the the splanchnic area are inhibited and dilatation is the result This acts as a safety valve, as then the heart does not have so grrat penpheral resistance to overcome and it is able to empty itself. Conversely: If the splanchnic area is stimulated there would be arterial contriction, the blood pressure would be raised peripheral resistance in the arterioles greater, and this would act reflexly on the heart and call for stronger work on the part of that organ. This is not the only effect of splanchnic stimulation.

There may be a renal contriction. This would increase renal tension and M. Huchard in Amer. Journal of Med.Sciences, says that the blood current is quickened and that abundant duresis can be obtained. Thus you see what effects may be produced both on the heart and the kidneys through these nerves. These are experiments of a physiologist, but just such results are to be obtained by the osteopath, for all these forces are able to be controlled by him. I have given you the effect produced by a violent stimulation of the abdominal sympathetics caused by a violent blow on the epigastrium.

A stimulation of the sensory nerves of the intestines has a like effect. A tapping upon the abdomen at a steady rate stimulates the sensory nerves of that region and this reflexly arrests the hearts action.

Agin there is an experiment performed by Goltz, in which he

cut a window in the chest wall, then by tapping with his scalpel at the rate of 140 times per minute he soon stopped the heart action.

These experiments teach us that the results of stimulation to certain nerves may not act as stimulators, or increasing energy to other parts, but rather the opposite, as a restraining influence by a reflex act. That is, that stimulation of certain nerves may result in inhibition of certain organs. We will not notice another way in which inhibition is produced. Let us examine the effect of pressure on a nerve. Slow pressure applied to a nerve, although very slight, if continued for a time, causes a familiar tingling in the area of distribution. Somestimes therr may be a sense of warmth with disordered sensations and even a loss of sensibility in the skin. This pressure may be sufficient, or rather, may be accompanied by an inability to use the muscles supplied by the nerves of this region. After removal of prrssure the sense of cold and the inability to move the muscles are the last to pass away. (Explanation). This compression has caused an anaemic condition of this region (b) It has the effect of separating the white substance of Schwann, lessing the conductivity of the nerves. Weir Mitchell's experiment very clearly demonstrated that pressure would completely abolish the conduction of nervous impulses. He placed about twenty inches of murcury on nerves and let this pressure remain for only 20 seconds. Conduction was completely abolished, though only for a few minutes. Though if the pressure had been gradually applied and remained for some time, the nerves would have become paralyzed. After removal of such pressure, where it has not been sufficient to greatly injure the nerve, there are excitory processes accompanied by prickling sensations. These are premonitory signs of the return of sensory functions. We have some familiar examples of such phenomenon. Pressure from sitting on the sciatic nerve results as heavy feeling, lack of motion, prickling sensation accompanied with tingling in its distribution.

During sleep there may be pressure on the brachial plexus. This may be very slight but it is continued for hours by lying on that side. The result is that there will be cramps and powerlessness, and on the beginning of returning function those prickling sensations are felt same as in the leg. This tingling may be felt in the regoin of the ulnar nerve. In this instance the cause of is the pressure on the ulnar nerve by flexion of the elbow during sleep.

Crutch paralysis may be caused by the pressure of crutches on the brachial plexus. According to the length of time it has sustained pressure, just so marked are the results.

5th. We will endeavor to show the similarity in effects of a cut nerve and one on which steady pressure as has been brought to bear for a time. (a) We may take the abdominal aorta. If it is cut there will follow paralysis below cut because of the blood supply being shut off. (on rabbits). If pressure is brought to bear on the abdominal aorta and continued, it will just as surely shut off the blood supply; the nerves will loose their irritability and conductivity and soon a paralysis will follow.

We will not take Claud Bernard's experiment on the ear of a rabbit by cutting the cervical sympathetic. He found that on cutting one side of the cervical sympathetic there was a more

active circulation on the corresponding side of the face, the ear becoming very congested and an increase of temperature followed. Brown-Sequard concluded in such cases that the cutting caused a paralysis, hence there followed a dilation of the vessels because of lost control of constrictor nerves. The same effect can be produced, so Kirke says, by pressing forcibly on the nerve where it lies by the side of the central artery of the ear. In this case the pressure acted in the same manner as the cut, in that it paralyzed the nerve and shut off the constrictor impulses. Then followed the dilatation, redness and warmth of the ear. Thus you see pressure can cause similar effects to that produced by cutting a nerve.

Thus far I have not mentioned to you the effect of electrical stimuli. In your physiological studies you have seen how it is applied and its effects. Today I will mention a few points of practical application, or so considered by physicians. Strong battery currents alter the irritability and conductivity of nerves and muscles. Any point which they wish to influence, one pole of the battery is placed immediately over it. If they wish to lessen the excitability the anode is placed there. If to increase the excitability the kathode is placed over the affected part. Although it must be remembered that when a decrease of excitability is brought about, a cessation of such currents is followed by a reaction and consequent rise of excitability. This is not the inly way to bring about a decrease of irritability, as pressure gradually applied will lessen the power of nerves and muscles to respond to irritants. When first applied it may cause a slight increase in irritability but of short duration. Again the stretching of nerves surgically is sometimes employed to destroy their excitability. An instance: The surgeon, to destroy the excitability of the sciatic nerve cuts down to it in the gluteal region. The patient on his face, enough force is used in pulling on the nerve to raise the foot from the table. The effect of this is to destroy its excitability for a time and to materially lessen its conductivity. If the stretching is so grrat as to do positive injury to the axis cylinder process it sets up a degeneration and in such an instance the irritability or at least the conductivity is entirely destroyed. It seems though that these nerves under such conditions have the power to regenerate. This will bring about a return of these functions. (Remember Lister's Law "Every cell possesses the inherent power to recover after injury") Given in a previous lecture.

This one thing yet you must note, that a stimulation may bring about an inhibition and that an inhibition may cause a stimulation. I have given you examples of stimulation causing an inhibition, that is, where the sensory nerves of the abdomen were stimulated by tapping and the result was an inhibition of the heart's action. Stimulation of the abdominal plexuses will have the same effect. We may take the heart and its fibers of control as a good example of this point. The inhibitory fibers found in the vagus, if they are stimulated the heart's action is slowed, resulting in inhibition. If these inhibitory fibers are inhibited then the heart's beats are increased, resulting in a stimulation. Again, if the accelerator fibers are stimulated stimulation of the heart's action is the result. If these accelerator fibers are inhibited then inhibition of the heart's action is the result obtained.

Lecture 15 - 1

The continuation of Osteopathic theory of controlling nerves and blood vessels. The two previous lectures having given us the definition of stimulation and of inhibition and the manner in which the physiologist applied the stimuli and the effects produced.

1st. We have learned that the physiologist in his experiments worked externally part of the time in applying irritants to the nerves and muscles. That by the irritation he was able to produce a nervous impulse which would either cause a stimulation or an inhibition of function, hence he said that the product of the irritation was a physiological stimulus, becuase the action was similar to normal.

2nd. The physiologist produced his effect directly on the nerves and centers as a blow or pinch, as on the ulnar nerve or pressure on the sciatic or the brachial plexus. And that he also could affect both excitability and conductivity of nerves.

3rd. That he can control the blood supply of the body by affecting nerves and centers reflexly. Generally this was through the sensory nerves, as when he used a high or low temperature, also by the means of a working muscle. But the greatest control exhibited was by or through the splanchnics, and the abdominal sensory nerves reflexly on the heart.

The osteopath claims he can affect the nerves and nerve centers of the body and also control the blood supply of the body. The question arises, how can he do these things? He works upon the external surface of the body. The physical agencies that he uses are mechanical stimuli. The external manipulations are such as will in some way either directly or reflexly affect nerves and nerve centers. In the course of our lectures enough evidence has been adduced for us to know that the osteopath does affect nerves directly. First it was shown that a nervous impulse could be generated by irritating any part of a nerve cell, this including the neuron in any part of its course. This was shown to be true by stimulating a nerve fiber and noting that the effect produced was one similar to its normal action, hence we reasoned that we had produced a physiological stimulus. It was also shown that by pressure directly on nerves that the irritability and conductivity of nerves were lessened, in that we caused a break in the continuity of the semi-fluis acis cylinder, or, more properly speaking, we pressed on the myelin and this in turn exterted its effect on the myelin sheath and the axis cylinder process. Thus an action was produced which was an inhibition of the normal work. This recapitulation shows very clearly that nerves may be affected directly, hence we may know that the osteopath may affect nerves anywhere that he can get at them. But as all the nerves of the body are not directly accessible his work would be limited if he could not affect them otherwise. Now the statement is made that he can affect the nerves and nerve centers reflexly. It seems to me that this point would beprove if we show that he can produce a reflex act. I will at present give you two instances of his producing a reflex act. (a) By stroking the skin of the abdomen the muscles of this region are made to contract. (b). By tickling the soles of the feet there will be a flexion of the leg followed by extension. What was done in these two instances? An afferent sensory nerve was stimulated; this stimulus was carried to a center, which caused the center to discharge its energy. This energy was shown in

movement that had acted from the impulse brought by the efferent nerves. These are reflex acts and we succeeded in producing them and in so doing both nerves and centers were affected. In these instances we must be allowed to say with the physiologist that we produce results similar to normal and therefore we produce a physiological stimulus. As a proof of this, voluntary movements and reflex movements appear identical with the exception of the exciting cause. They are identical except that the voluntary are caused by volitional impulses from the brain and the reflex movements are caused by afferent impulses from afferent nerves. (explain two kinds of afferent impulses). This proves conclusively that the osteopath can affect centers reflexly. Yet a few points on the same line. A person has a spasm of hiccoughs. we are generally able to stop the paroxysm by pressure on the phrenic nerve. (A case of epistaxis, as follows) A young man was acting as umpire of a ball game. The ball flew wide of its course or else the umpire was in its way, at any rate, it struck him squarely on the nose. He dropped as if shot while the blood spurted from his nose in a stream. Dr. Hildreth had hold of him in a few minutes or seconds and succeeded in stopping the flow of blood from the nose in less than two minutes. In the first case the pressure on the phrenic acted as an inhibitory influence on the diaphragm as it allayed or quited the action of this muscle.

In the second case there was a stimulation of the cervical sympatheticswhich acted on the medullary vaso motor center and stimulated the normal constrictor impulses. The result was an action similar to normal, therefore the irritation must have produced a physiological stimulus. Why I say these result in physiological stimuli is this. In the work on nerves or centers we just as surely stimulated or inhibited the nerve as the physiologist, as we produced an irritation which generated an impulse and this impulse caused an action similar to normal. Then we must be allowed to say with the physiologist that we have affected nerves and centers and that the work was produced by a physiological stimulus.

As the blood vessels are supplied by nerves and the nerves can be influenced both directly and reflexly, thus it is possible to control the blood supply of the body. I have shown you how the vaso motor centers in the medulla can be affected through the influence of afferent impulses on sensory nerves. (Sensory nerves in abdomen, also sciatica)

A summary of all this would be as follows: All parts of the body are controlled by the nerves. The osteopath is able to affect both nerves and centers. He can affect nerves and centers either directly or reflexly. All the nerves of the body are accessible to him, those not directly are so reflexly.. Hence, as the whole field of nerve force is open to him, and by means of the nerves and the blood supply the range of work no the body is unlimited. It must be remembered that inhibition and stimulation in themselves are not the most important part of our work as osteopaths. That the removal of lesions is of primary importance to us and we will speak of this in some future lecture.

The purpose of giving this part the time I have was to prove to you that osteopaths are able to control the blood and nerve forces of the body without recouse to medication or chemical stimulation in any manner whatever.

There are other means at the command of the osteopath in which he may affect the blood and nerve forces of the body. They are just as truly at the command of the physician, yet, as they are non-medical I think it pertinent to mention them here. That is the influence of heat and cold on the body.. In the use of heat to the body it may be either moist or dry. (Define fomentations stupes)

Vascular dilation may be caused by the application of moderate heat to the skin. Where this heat is applied locally the vascular dilatation would cause an increased loss of heat by radiation. If heat above the temperature of the body is applied some of this heat may be absorbed, as rediation and conduction can not occur. For this reason application of heat to the entire body in the algid state of cholera or when infants are born prematurely. This causes such a dilation of the blood vessels that on the removal of the heating agent great care must be used in order to prevent the escape of heat from the body.

The effects of heat on the body may be summarily as follows: 1st. Delatation of cutaneous blood vessels. 2nd. Excitement of the general circulation. 3rd. Increase in respiratory movements. 4th. Increase in the amount of sweat. 5th. Diminished tonicity of the muscles. While Green states that vascular dilatation of deep organs may be produced reflexly by the application of stupes to the skin over the organs you wish to affect.

In the applicationoof cold to the body it may be to the whole or part of the body, just according to the result we wish to obtain. It may be applied to the whole body where there is a high fever and it will abstract heat from the body if applied gradually.

Cold may be applied locally by means of an ice bag. This causes constrictions locally and an abstraction of heat locally. Cold may be taken internally in the way of cooling drinks and have a reaction on the body. The effect of applying moderate cold to the body is. 1st Constriction of cutaneous vessels. 2nd. Diminished amount of sweat. 3rd. Increased tonicity of the pilo-motors and skeletal muscles. There can also be vaso motor effects, especially on the kidneys by the application of cold, causing a renal constriction. The above shows that both heat and cold affect the vaso-motor nerves; that they may be used to allay and reduce inflamations, thus proving but another means by which the Osteopath may regulate the blood forces of the body without medication.

LECTURE 16 - 1

Methods of treatment compared: Our contention is that it is possible to affect the blood and nerve forces of the body without medication. The Osteopaths position is that by mechanical means and external manipulations he can produce the desired effects on both the blood and nerve forces of the body sufficient to assist nature to allay and to remove the ravages of disease.

Just at this point it may be well to compare the effects of the two systems of treatment on the body. It would be proper to speak of the effects produced on irritation and conductivity of the nerves and muscles, especially nerves. It is found that nerves and muscles, in order to have their normal irritability, that is the power to respond to stimuli, must possess a certain chemical constitution, and this condition must be maintained. The slightest variation from the normal chemical condition alters, and if long

continued will destroy the irritability of nerves and muscles. It is peculiar also that the first step toward deterioration is a rise in irritability. It should be noted that if a certain drug is given to produce an increase of irritability it may only lead to greater deterioration and ultimately destroy this property. It is known that most drugs and chemicals which are able to influence irritability, will at first increase this property and later destroy it. There is generally a diseased condition of some of the nerves of the body, that is, an alteration of the normal chemical constitution and the physician uses different drugs or chemicals to affect this same property of nerves and muscles and this only disturbs its composition to a greater degree. He may say he is introducing certain chemicals that are needed in the body. Now it seems to me that he cannot introduce any that will restore the normal constitution. The only thing that does do this is the proper nourishment which must come from food. There is a scientist in Washington city, or at least he claims to beone, who says the only way to get the proper chemicals into the body is by taking them into the stomach in an organized form. What he means by that is this: Iron as found in fruit is an organized form. It is taken into the body, assimilation takes place, the iron in this way is appropriated to form the necessary compounds into which the substance enters. While if it is taken as a drug it is in what he designates an unorganized form, as a chemical, and the result is the system does not assimilate it. Hence these drugs act at first as producing an increase and later a decrease in irritability. In fact substances are introduced that alter the very chemical constitution that is wanted. The physician may use the electric current, the same result follows. That is an altered chemical constitution which means a changed irritability.

Reiterating the statement I made a few moments ago, that the only way to prrserve normal irritability of nerves and muscles is by or through a proper blood supply. As there is a constant tearing down process this waste matter and surplus energy must be carried away, also must be met by a reparative process which consists in proper nutriment and oxygem. These two objects are accomplished by means of the blood stream. Again the conductivity of nerves are altered by an altered chemical constitution and it is found that generally the drugs and chemicals that increase or decrease irritability influences conductivity in the same manner. Therr are some exceptions to the rule. Alcohol, either and such chemicals destroy conductivity and do not materially alter irritability. Carbon dioxide may destroy irritability and not change the conductivity. The question, who introduces these detrimental substances or chemicals into the system, not the osteopath? Hence if a comparison of effects of the two methods of treatment areis made we would be sure to find the following: The physician uses chemicals and drugs to affect nerves and centers. These drugs will alter the chemical constitution of nerves and muscles. This alteration according to Howell's if continued is likely to destroy both irritability and conductivity.

The osteopath does not introduce any foreign substances into the system. It must be remembered that he does affect both irritability and conductivity of nerves, not by foreign substances but by the forces already at hand and his external manipulations. Nor

is he likely to destroy both irritability and conductivity unless he is a quack osteopath and treats so hard as to cause actual injury and thereby degenerative changes.. But he rather, by his treatments assists in getting a normal flow of the fluids of the body and likewise the normal condition of the nervous system. Hene if it was true that physicians and osteopaths could stop the progress of disease, the one as well as the other, the wise man would preferably get the osteopath, as from his treatments there would be no detrimental effect on the tissues of the body. Such cannot be truthfully said of drug medication. As it is found that many drugs and chemicals not only affect the system as I have told you to-day but injure the tissues in other ways. Many times you hear them use the expression,"Your system is not strong enough to bear the strong medicines you ought to have." (explain) These are not long drawn statements, but out of their own mouths are they condemned, in that they say many neurotic conditions are due to the constant doping of the system with powerful medicines and again one disease is only cured by causing another. (Explain). I have shown you in previous lectures that the osteopath affects internal nerve life by external manipulations. This can only be accomplished by reason of the close and numerous connections of the cerebro- spinal and sympathetic nervous system. I have shown you how sympathetic nerve life may be affected by or though the sensory nerve endings. 1st. As an example we had a stimulation of the sensory nerves of the abdomen acting on the nerves of the heart to stop its action. Although this might be considered to act more through the cerebro spinal system. But any action that by means of the sensory nerves affects vaso-mortor life thereby affects sympathetic life. I gave you a few examples of this which it is unnecessary to repeat here. (cut sciatic) We have also learned what is meant by stimulation and inhibition; also how we may affect nerves and centers in two ways, directly and reflexly As to how we affected a nerve and its distribution directly, you remember the case of pressure on the sciatic, sometimes from sitting. (Explain results following.)

How we affected a center by simple inhibition. To illustrate this point, it is done very nicely by the same example I shoed you that pressure on a nerve was considered by some authors equal to cutting a nerve, in its immediate effects. Viz., cut cervical sympathetic and pressure on central nerve of the ear. (Might be reflexly).

That we affect centers generally reflexly: In the case of epistaxis given you in a previous lecture; The result was obtained by stimulation of the cervical sympathetic, which acted on the vaso motor center and this stimulated the normal constrictor impulses and brought about contraction of the arteries.

There is still another way to affect nerves and also centers, that is by removal of a lesion.. We have had a definition of a lesion, meaning any-morbid condition in its broad sense. Hence it would include any misplacement, direct pressure, congestion, contracture or any nutritional trouble, really being any obstruction to the blood and nerve forces of the body. The great object of an osteopathic examination is for the purpose of finding a lesion. Sometimes it seems hard to find one that may be considered sufficient to cause the symptoms found or gotten from the patient. Yet the more readily an operator locates a lesion the more readily

he handles his case. Why? Because unless work is well planned results are unsatisfactory, as he may treat and treat and yet not cure the particular trouble existing. Yet it is true that some good may be accomplished but only on the general circulation of the body, or such as would result from a general stimulation.

Just at this time I wish to speak of a couple of expressions used by osteopaths. They are used by some until they are threadbare yet there is some meaning conveyed in them if we but understand it. The first one is, that there is the ever present tendency toward the normal" That is that this is the effect of our treatments, also, that if parts are manipulated thataare not diseased this same reason is given as to why there are no bad effects following such treatments. If the parts not diseased are stimulated or manipulated it acts only as normal exercise would do. Of course there is a difference as one is active, while in our work the patient is passive. Again with regard to the diseased parts, it is only another instance of the law that "every cell has the inherent power to recover after injury." Our treatments are such that this recovery is aided by the effects we get on the blood and nerve forces of the body. We locate the lesion, then by our treatment remove the lesion and in this way reestablish the nerve natural law of nerve force and circulation, then nature completes a cure.

In the course of future lectures I will show you what truth there is in this statement. I have shown you in previous lectures the way nerves and centers were affected, but not in connection with removal of lesions which is to be considered in the fture.

This one point and I am done for to-day. In the removal of lesions it is many times that we do not take into consideration as to whether we are stimulating or inhibiting by treatment in a certain way. The point is to remove the lesion. It can readily be ascertained as to what the result will be, whether stimulation or inhibition. If the lesion wassuch as to be a source of irritation to the nerves, or removing the difficulty the source of irritation is stopped and the result would be the same as if we had inhibited those nerves. Again, if the lesion was such as to cut off nerve force or blood supply there might be a partial paralysis existing at such a time and removal of the lesion amounts to stimulation, because the condition present was a lack of nerve force or blood supply and our treatment was such as to bring about the normal condition.

LECTURE 17) 1

To-day we continue the thought started in last lecture, that is the way centers are affected by lesions, also nerves. The first of which we will speak is contracture.

In a previous lecture I gave to you the distinguishing points petween muscles hardened from use and those abnormally so. (name them). The only authority I succeeded in finding to bear me out in my statement is the American Text book of Physiology and Gowers on the nervous System. Possibly there are others but my time was too limited to permit a search. This author states,"If a muscle be in an abnormal condition or is dying, the irritation may cause a contraction that may remain localized as a circumscribed swelling or welt." So that you see where we find those welts or little raised places slipping under our finger we know the abnormal condition present. I will also give this statement from Gowers: A

part of a muscle may pass into a state of spasmodic contraction evidence not by a distortion of the parts to which it is attached, but by a swelling of the muscular substance. Thus you see a second author says that such conditions exist and that they are not normal. That there is a contraction of some fiber and not other, or of some fibers more than others and that they hold. Such conditions as these, being abnormal, must be remedied by us when found. The above condition named is partly explanatory of what are known as phantom tumors. You see that a local swelling or tumor is produced which may stimulate a morbid growth. Gowers states that these tumor-like enlargements have been found in the calf of the leg, also in the pectoralis major. The phantom tumors of the abdomen have a similar explanation but their mechanism is not as simple. They may appear in any part of the abdominal wall but it is generally in the middle part of the abdominal region just below the umbilicus. There is generally a proteusion in this region, prominent and bulging forward as if some mass within was causing the protrusion. The production of these tumors seemed to be brought about in the following manner. There is a relaxation of the rectus muscle and a spasmodic contraction of the diaphragm. Then the intestines, often distended with flatus, are pushed forward in the region where the wall is lax. An arching of the vertebral column may have this effect. Sometimes this enlargement of the abdomen may be general. The entire front wall is lax, and the protrusion may become general. These conditions may be made to disappear if chloroform is given. I an not sure if strong emotion may not cause thier disappearance. You may think these phantom tumors arenot worthy of your notice, but they are decidedly so. Suppose a patient comes to you and complains of a seeming tomor-like growth. It may be no larger than a small fist. It may be in the intestinal wall, if so, you must discover its character. It may be in the abdominal wall and then you must distinguish between a real tumor and this lax condition of the abdominal wall. Again where the entire abdominal wall is lax it may simulate pregnancy. You may think you could never be fooled in this way and yet physicians have been fooled, and good ones too. There are two conditions that may bring this one. The one is when a woman wishes to bear children and it seems she is not able to do so. Every condition of symptom of pregnancy is watched for, before long it may be possible that there is a slight notice of one., then it continues to be followed by others and it is curious that in some of these cases there is an accompanying enlargement of the abdominal region which can only be made to disappear by the ways I mentioned. (Give case of a lady to full time.)

The other is when a woman wishes not to give birth to any children or where a woman thinks she has acted so that she is afraid such a thing may occur when she knows she should not have done so. In these instances a morbid fear is produced. A watch is set for every change of condition. In their morbid fears they almost manufacture symptoms and soon they are sure that a pregnant condition exists. Be fortified and then these cases may be diagnosed rightly by you. This is somewhat of a divergence, yet it seems to fit in here, but now to our contractures. The question arises as to what they are. I will quote from Gowers. "The term contracture is applied to the condition in which the muscles become rigid in tonic spasm.." That is a tonic spasm of muscles.

Again he says tonic spasm persistent and involving only a certain group of muscles is also often termed contracture. While Kirke and Howell both consider contractures as a continuous contraction from a continuous excitation on the order of a tetanus, although ont exactly corresponding with its fatigue effects. You know a tetanus is a sustained contraction caused by a series of physiological stimuli, being carried to the muscle by its nerve.

It might be well to enter into an explanation of a part of the above definition, especially as we use the word tonic spasm and this must not be confounded with clonic spasm. 1st. It must be remembered that muscle is normally taut between its insertions. This is brought about by means of its nerves and the external sensation conveyed through them. This taut condition is such that a muscle is ready to contract in the shortest possible time when receiving a stimulus, and by means of a succession of stimuli is thrown into the tetanic condition. Then if the tetanic condition of a muscle is continued so as to be persistent and rigid, we have the condition known as tonic spasm or contracture. again we could say that a tonic spasm of a muscle is when it is on strong tension, there being a rigid, unrelaxing condition. It must be remembered that involuntary muscles are not to be thrown into a tetanic condition and consequently not enter into a tonic spasm such as we have explained, yet it does enter into a condition called tonus. This tonus is a sustained contraction of these involuntary fibers and is of the same importance to us, and stands in lieu of the contractures of voluntary muscles. This use of the word tonus must not be confounded with the use of the word when speaking of tonic taut condition of voluntary muscles when not in use. (explain two uses of the word tonus) The other expression to which I wish to call your attention is this: Clonic spasm. A clonic spasm is characterized by alternate convulsive contractions and relaxations of muscles. They are thus seen to be very different from tonic spasm and sustained contracture.

We have seen from good authority that contractures do exist and that our idea of contracture is proven by recognized authority Hence when we make an examination of a patient and tell him we find a contracture here or there, it is within our province to give him satisfactory evidence of such a condition. One demonstrable on the body, the other by abstract reasoning.

It may be that osteopaths use the word contracture in a somewhat proader sense than that given above. We will speak of this again when giving causes of conttacture. One thing for us to know is where these contractures may be found. They may occur in the limbs, on the neck, back and abdomen. Especially must we take into consideration the hardened condition sometimes found in the stomach and intestinal wall.

There may be contractures of the muscles of the chest wall as evidenced by inter-costal pain. Another case illustrative of this particular point: A dentist in his work has continually to bend the body, at the same time giving it a peculiar twist. One arm is raised higher than the other during most of the proceedure. This is an unnatural position, and continued, is a potent cause of irritation to some of the nerves of the chest wall. This eventually leads to contractures. The particular dentist I have in mind, from just such irritation and consequent contracture, had to be satis-

fied to work on half time and take a series of osteopathic treatments. In giving you the location of may of the contractures, this only tells you where you are most likely to find them located. It is my belief that contractures may occur in any part of a set or any set of muscles in the body.. The causes of these contractures are as varied as their locations. It might be well to give or enumerate a few of them so considered by physiologists, pathologiss physicians and osteopaths. The case of the dentist just mentioned is one potent cause for contractures. It seems where muscles are put on too much tension, it is sure to cause irritation and, if continued, lead to contracture. An explanation of this may be found in a statement made by Gowers as the result of the researches of Tschirjew. He states that the sensory nerves in muscles do not commence or end (just as you like to state it) in the muscular fiber, but in the intercostal connective tissue. Thus tension of a muscle will cause it to make greater pressure on these sensory nerve endings and if continued, lead to serious results. This tension is in a certain degree identical with muscular tone, but may act with a lesser stimulus as it does in a certain degree produce a stimulus itself. In this manner effects on the sympathetis are obtained by means of these same sensory nerve endings and it has been given as an explanation of the sore spots along the spine. In the case of a second contracture as we have explained heretofore, disease of some viscus may, through the sympathetics, be the cause of the irritation and consequent contracture. Other causes are primary diseases of the muscles, chronic irritation of motor fibers or primary disease of the nervous system, one set of muscles being stronger than another, also loss of antagonism from paralysis, etc., nutritional disturbances, leading to changes in excitability, are potent causes of contractures. It must not be forgotten that sitting or maintaining one posture for any length of time may similarly lead to these contractures. When such a result is brought about in this manner it generally leads to structural changes of the tissues concerned. It would also include diseased condition of the cord. There may be strong cutaneous irritation, giving rise to cutaneous reflex action. These cutaneous nerves or the arc through which the cutaneous reflexes are performed may be caused to act by stimulating the nerves of the deeper structures, including both muscles and tendons, aside from cutaneous irritations.

Osteopaths find that misplacements, strains and also injuries are very potent factors in causing contractures. These local contractures may be caused by neuralgia and rheumatism. There is contracture existent with the hysterical or brought on during or after an attack of hysteria. These contractures caused in such a manner are often very difficult to manage. If the contractures are local it is generally considered as caused by the injury or the neuritis If the contracture is extensive, progressing until nearly half of the body is affected, it is generally assumed to be of a hysterical character. Dr.Gowers gives a case to illustrate this point. A girl sixteen years of age slightly burned her wrist with a hot iron. At first there was only a slight pain in the thumb, soon followed by entire loss of sensation there ; within a week flexion of the fingers was very marked and in a few days the contracture had extended to the legs. There was also overian tenderness of the same side. It was known that the injury was not sufficient to cause one tenth of this trouble so it was ascribed to hysteria.

The proper moral treatment was given and she was well within a month. (about disappearing under the influence of strong wemotion. case of Miracle worker).

LECTURE 18 - 1

Continuation of Contracture:

We have had a definition of contracture, also where they are generally found and then a word was given as to how you might distinguish the real contracture from the hysterical form. The hysterical form is of considerable importance to us ~~clinilly~~, or in our own practice. I have in mind now a bed-ridden patient, one with paralysis of the lower limbs. This patient's trouble all dates from a time when she was foiled in getting her own way and nothing would satisfy her, not a thing would she eat for as long a time as she possibly could abstain from food. .Contractures in the limbs were noticed and then she claimed she was paralyzed Today the paralysis does actually exist, so I am told, although I have notoseen the patient. If such is the case, she brought it on herself by keeping one position so long that structural changes in the tissues of the limbs was brought about, hence the present condition. Such patients as these need the mental or moral treatment as well as regular osteopathic treatment.

I think it well to speak further of the improtance of contractures to us. If I mistake not, in our lecture on centers, I gave you one on the left side about 4 D. that if affected seemed to make the patient despondent. If on the opposite side, the right, it had the effect of making them rather silly, act foolishly. If a contracture exists on the right side it may result in just that trouble. If the contracture exists on the left side between the shoulders, the despondency is very likely to be a characteristic result. There are also three other effects that may be noted when on this left side, weakness, general debility and irregular heart action.

It is also true that when paralysis of the limbs exists, ... brought on in any manner, that contracture is associated with it. The explanation of this seems to be that the motor fibers of the paralyzed area are affected enough to cause the contracture.

Continuing the though 1 advanced above, that structural changes take place in these tissues when the above condition exists for any length of time. An explanation of this is found in two ways. 1st. Because of non-use of the muscles. 2nd. In the control the nerves exert on the nutrition of tissues and especially muscular tissue.

Here is a point that may be of diagnostic value to you: If general rigidity of the body is found to exist without any accompanying paralysis, it would indicate that the trouble was caused by a tumor on the brain. The tumor does not seen to cause sufficient pressure to paralyze the nerve fibers, but to be of such irritating nature as to cause the contracture and consequent general rigidity.

It is claimed by some that contracture may mechanically shut off the blood supply to a part. If this be true, it would be of

no particular difference as to the cause of contracture, as the contracture causes sufficient pressure on the arterioles of the region to deprive the part of a portion of its blood supply. This would lead to collateral hyperaemia of parts supplied by the same blood vessels. We have examples where contracture has not only shut off the blood supply mechanically but has caused paralysis. I remember seeing a case of paralysis of three years standing, caused by La Grippe. The person in question had comparatively good health before the attack of Grippe. The spinal muscles were all found to be very much contracted and hardened so that not only the blood supply but the nerves were affected. There is another way in which this might be explained. That there was an inflamatory condition of the cord. This inflamatory condition may be caused by the collateral hyperaemia when the contratcures shut down on spinal blood-vessles, or it could be caused directly from the fever of the Grippe.

The most important effects of contractures are on the vaso motor nerves. We have noted the fact that the sensory nerves of muscles end in the instertitial connective tissue, hence contracture is sure to produce irritation to these sensory nerves and in this way nervous impulses are generated which travel to a center ad reflex effects are brought about. The muscles of the neck may contract from exposure to cold and cause a mechanical shutting off of the blood supply. It also sends afferent impulses to the sensory nerves , to the medullary vaso motor center and the result of this irritation is to cause grrater constriction of the vessels of this area. The tendency of all contractures, whether primary or secondary is to affect nerves and thereby centers. In what manner is this brought about? These contractures generate impulses by their effects on the sensory nerves. These impulses so generated are carried to a center by afferent nerves. Accordingly then as the center affected so the result. To show the fra reaching effects of contractures, of both primary and secondary form, a case to illustrate each. A pain between the shoulders, on the right side and near the infreior angle of the scapula is generally an indication of liver trouble. On examination there is found to be contracture of the musclesof this region. I think I have explained to you how this was brought about, in a previous lecture. Suffice it to say now that the irritation to the sympathetic nerves affected centers, and then the connection with the cerebro-spinal system explains the pain and contractures as expressed on the back.

The sympathetic nerves are affected through the sensory nerve endings on the body wall, instanced by the stimulation of sensory nerves of the abdomen. Hence when the sensory nerves of an area are irritated for any length of time it will affect sympathetic nerve life on that part of the body connected with the cerebro-spinal center so affected.

There is still another way in which lesions affect the tissues of the body. I speak of the blood supply in which the nutrition of the tissues are affected. We have so far spoken of misplacements strains, direct pressure and contracture, also the effect of each lesion. In most casesI have shown you how to remove such lesions. uence the necessity for an osteopath to be a good anatomist. It is not sufficient for him to have a knowledge of the book anatomy and his fingers familiar with the cadaveric form. He must educate his touch upon the normal living body. He must educate the eye

and hand until they get in the habit of working together.

In examinations of patients it is true the osteopath does question the patient but his judgment is mainly based on what he finds upon a physical examination. Hence the osteopath by his knowledge of anatomy and by his educated sense of touch is doubly qualified to make a correct diagnosis. Yet there are other equipments he must have. You are getting them here if you improve your time. Hence as our diagnosis is principally from a physical standpoint, we should make ourselves familiar with different texts on physical diagnosis.

Be careful in making your diagnosis. Do not make them by telephone as I was called upon to do and refused. (Case of Mr. Hensleigh of Page Co., Iowa) The old school physician many times are able to make a diagnosis of the conditions existent without any examination of the patient further than to ask them a number of questions. They may look at the tongue and feel the pulse. I do not say how correct the conclusions are which have been reached in this manner. This I do know, that an osteopath in addition to the above, has the advantage of a physical examination of the body. Hence he has the advantage of being able to make a more correct diagnosis, in that the evidence is greater from which to draw his conclusions. (Mention about looking at tongue and feeling pulse) Why? First, as to what they tell us. Second as to effect on patient.

We have had a slight diversion, - now to contractures again. After having seen the effects of contracture, it is apparent at once how necessary to remove these lesions, and in this way eradicate concomitant troubles. Hence the expression that an osteopath must correct or adjust abnormalties, remove lesions and bring about a correction of all the fluid channels of the body, lymphatic channels as well as blood stream.

There are cetain conditions in which the tables seem to be turned. What I mean by that is this: Instead of removing a lesion and thus affecting a blood and nerve force of the body, we seem to stimulate or inhibit the action of nerves and thereby influence the circulation in such a manner as to bring about the removal of lesions. Many times there may be rheumatic deposits about some of the joints. Again an absess may have formed in some part of the body which it seems unwise to cut into. In such instances and similar ones it would seem that the only way to remove them is by a proper stimulation of the blood and nerve forces of the body and cause an absorption and removal of such troubles. It seems though, where these chalky deposits are found, that some trouble may be found in the digestive track or accessory glands, hence it would be necessary to seek this primary cause and remove it by the proper treatment as well as giving the frequent stimulating treatments to which I just referred. The same is true, I think, when we say we have cured a headache by inhibition. There may be contractures of the neck muscles which will affect the nerves of this region. There may be a disturbance of equilibrium of the vaso- motor nerves. This disturbance must be removed, especially if there is an impulse sent to the vaso-motor center constricting arterioles of certain areas of the body. (Find lesion and remove it is the substance).

LECTURE 19 - 1

Dr Hart's theory and removal of lesions.

There was a theory advanced by Dr.M.Hart of Bethany, Mo, which I think worth while to give you. It was on the removal of lesions He states that we always remove lesions. Further that contractures from some cause appear along the spine. This contracture leads to an anaemic condition of the muscles along the spine. This anaemia here will lead to collateral hyperaemia in the vessels running to the cord, as the same vessels that send pranches to the spinal muscles, send branches to the spinal cord. This shows two conditions present. The one the hyperaemia of the cord, the other the anaemia of the spinal muscles. Taking the one hyperaemia to the spinal cord, this would be an irritant to the nerves, stimulating them to action. This continued stimulation would eventually lead to inhibition.. If you have an anaemia of a nerve it robs the nerve of its nutrition, causes inhibition and may eventually lead to paralysis. The one, you see, resulting from too much blood thrown to a part, causing an over activity which eventually results in inhibition, the other from too little blood to a part, producing an inhibition.

Contracture is the lesion and the final result is the same in either case, inhibition. He reasons that our duty is to remove the lesion.

The second point which I wish to bring before you by means of his theory was the effect of anaemia and hyperaemia as shown by Dr.hart. It seems to me it would be well for you to put a little thought on this theory, although it is well for you to remember the primary lesion is not always contracture, as many times when there are contractures they may be secondary to misplacements and until the source of irritation is allayed, you may not succeed in entirely removing the contracture.

There is one thing about Dr.Hart's theory you must remember, that is, by a shutting off of the blood vessels is not the only way these troubles are brought about. I have not time to discuss it here but merely make mention. The blood supply or blood vessels are directly under the control of the nerves; that these nerves may be caused to act in two ways. First, directly, as the effect gotten directly on the vessel wall. Second, the effect reflexly through the medium of sensory nerve endings. This second point I have explained to you previously. I mention this by way of a reminder that you may thus start yourself aright.

In speaking of the effects of the nerves on the body, it has been mentioned that the blood supply affected the nerves as well as other tissues of the body.

We will notice some of the causes of anaemia. It may be caused by disease of the vessel wall as in atheroma and sympathetic thickening. It may be cause by pressure from without, as new growths, tumor extoses, constricting scars, inflamatory exuda-

tions and mechanical effusions. There may be an increase in the natural resistance of the vaso motor nerves from some irritation. This is sometimes caused in some neuralgic or other nervous afflictions. Then we may get pressure effects on the nerves as well as blood vessels by the products of metabolism when they are excess ive in amount of abnormal in character. While the anaemia generally results in collateral hyperaemia we may get a double result if long continued. Of what significance is this to us? Anaemia always leads to impairment of function and nutrition. Inpairment of nutrition may lead to very serious results. If in nerves the result is very likely to be degeneration. The pressure results may be of like import. If of nerves, this degeneration, Wallerian, as it is called, will be described in your pathological work and we will only notice the result which would mean paralysis.

The next point which I wish to bring before you is the results of hyperaemia and inflamation. The first thing necessary is to prove that hyerpaemia and also inflamation may be cause by lesions.

By hyperaemia or congestion is meant an excess of blood to a part. How may this condition be produced? Friction and slight irritants produce hyperaemia in the early part of their application Removal of the vaso tonic action of the sympathetics likewise produces hyperaemia.. This may be accomplished in two ways. First, by direct pressure as an aneurism in the neck, which will inhibit the normal constrictor impulse. Second, reflexly, by a stimulation of the sensory nerves and their effects on the vaso-motors.

Injuries of all kinds, when not acting suddenly and with severity produce hyperaemia. This is accomplished through the effect they produce on the sensory nerves. By remembering our definition of lesions, we readily see that the causes enumerated above are all considered lesions, or irritants which may produce lesions. Hence the conclusion that hyperaemia is generally produced by a lesion.

What is the effect of hyperaemia on the tissues? Let Green speak on this point. He says, "If hyperaemia be of long duration or frequently repeated, the small arteries remain permanently enlarged, their walls gradually thicken (why so) while the epithelium and connective tissues of the part increase. It is noticable that where the connective tissues of a part increase materially it seems to cause pressure on the higher parts of an organ and this will lead to inpairment of its function and still worse to an atrophy of the very essential cells of an organ. As an example you may take fibroid induration of the lungs. This may be caused by mitral stenosis. It leads to a mechanical hyperaemia of the lungs. This trouble leads to epithelial cells multiplied interlobular connective tissue, increased black pigment and thickening of alveolar walls and a deficient amount of oxygenated blood broungt to these tissues and connective tissues seem to be the only one to thrive on such food material. Both the deficient amount of oxygenated blood and the pressure of the new growth leads to atrophy of the higher structures of the organ, hence the consequent impairment of function. Mechanical hyperaemia will also lead to a diminished secretion of urine. The above also gives us an explanation of this fact. As the proliferated connective tissue causes pressure on the urine tubes and cause eventually their atrophy.. The increase of the epithelial cells leads to the thickening of

parts and hence the same impairment of functions.

There is yet the effect of hyperaemia on nerve centers to be considered. This is shown by great excitability, paresthesia of sight and hearing and may even result in convulsions. It shows exactly what was said in one of our first lectures, that to keep the body in healthy condition there must be a normal blood supply. If the cells are expected to multiply the blood supply must be increased. Here the blood supply is abnormally increased and abnormalties or diseased conditions are the results. Especially is the effect on nerve centers as given above. Hence we may sum up the effects of hyperaemia mechanical as leading to impairment of function and vitality and to atrophy of the higher structures of organs. If on mucous surfaces as in cases of catarrh it leads to a multilication of the epithelium.

The next point is to find out what inflamation means to us. We have not the time to enter into a discussion of inflamation. This we will state: That an inflamation embraces three properties or processes, one following the other and yet they are so connected as to be taking place almost simultaneously.

First process: Changes in blood vessels and circulation.

Second Process: Exudation of fluids and blood corpusels.

Third process: Changes in the inflamed tissues.

An inflamation is produced by a lesion. There may be irritation which may lead to an inflamation. An injury especially will lead to an inflamation also twists, slight or severe, subluxations and exposures. A strain or a misplacement may result in inflamation. There is an excess of blood to the lart which leads to an exudation. This exudation consists of lymph or serum and of cells both white and red corpuscles. One of the results of inflamation even when slight and long continued is the formation of new tissue or a new growth. This exudation when consisting of the lymph, a homogeneous matrix, and supplied with a pletiful number of blood vessels, will form scar tissue if in cuts. A similar process may be called embryonic tissue. In the different parts of the body it forms new connective tissue and this has a way of contracting similar to scar tissue. Green is authority for the statement that scar or fibrous tissue contracts and in this way is very likely to produce grave deformities, or atrophy of the essential glands of an organ. We then refers us to Cirrhosis of the liver. The lesion or irritation is generally from alcoholic drinking. This causes a chronic inflamation of the liver. The inflamation produces an increase of the connective tissue cells. This leads to new connective tissue and this new growth is sure to contract. This contracture causes atrophy of the liver cells. It obstructs the circulation through both the portal capillaries and the bile ducts. Thus you see that the result is that the function of the organ is impaired and the obstruction of the portal circulation leads to ascitis, haemetemesis and may result in enlargement of the spleen, diarrhoea or hemorrhoids. This is the result as shown in one organ. It is just as detrimental to other tissues or prgans As an example, notice the effect of inflamation on the spinal cord. There may be convolutions but aside from this there takes place a thickening of the connective tissue at the expense of the nerve elements. This would lead to degeneration of the cord and concomitant results, hence we see that inflamation may lead to the formation of new tissue which is sure to contract. This contractionis

is sure to cause pressure on nerves which will lead to degeneration and loss of function, or will shut off the blood supply of organs or parts and thereby cause an atrophy of the essential cells.

We must not forget the pressure symptoms on nerves. It may affect the distribution of nerves only, as the example I gave you of gangrenous third and fourth fingers of the hand from the pressure of an exostosis situated on the first rib. It exerted its effects on the fibers that make part of the ulnar nerve. Again the pressure of tumors on the spinal cord will cause vaso constrictor paralysis. All this sooner or later leads to degeneration.

LECTURE 20 - 1

In the previous lecture it was shown that lesions may produce either hyperaemia or inflamation; that either of these conditions produces thickening of connective tissues and lead to the formation of new tissue, and that the new tissue is sure to contract.

As many of these injuries causing these hyperaemic conditions occur along the spine, there is likely to occur a thickening of the tissues. As the ligaments are sure to be affected from any strain, misplacement, subluxation, etc., they consequently show the effects of this afterward. There may exist contraction of the ligaments. There may be a thickening of the ligaments following such lesion, hence the pressure effects on nerves are sure to follow. If the pressure is such as to produce a constant irritation to the nerves there is an over stimulation. This may lead to many troubles along the spine. Where these inflamations along the spine affect the bodies or intervertebral substances, it not only affects nerves and the surrounding tissues, but may lead to paralysis or death. Sometimes these lesions result in ankylosis of several vertebrae and in this way the inflamatory process is stopped. There is one thing which we ought not to do and that is to call an ankylosed condition of any joint or articulation a cure. This is very noticeable in Hilton when speaking of spinal or hip troubles. Patients come to us for the purpose of getting cured of such deformities, hence it was not a cure in the first place. I think it very probable that in many inflamatory conditions of joints and articulations that osteopaths could prevent any such result. We could remove the cause of such inflamations and by a proper course of treatments on the nerves and blood-vessels accomplish the desired result. There is one thing sure, if bony ankylosis exists we can do nothing if of the false kind or the ligamentous form we are very likely to be successful in our work and perform a cure..

There are two more conditions which may spring from inflamations and show pressure results. These are of Exudates and of Oedema. They may both cause an exaltation of sensation or again the pressure may be sufficient to cause a diminution of sensation.

The Oedema generally show a diseased condition of one of the three following organs, the lungs, the kidneys or the heart. Also diseased conditions of the liver may cause similar results. In our lecture on Wednesday it was shown very clearly how an inflamation of the liver would lead to an obstruction of the portal circulation and consequent ascites, dropsy, retention of lymph in connective tissue spaces or in servus cavities. Oedema,- limited to connective tissue spaces. Anasarca,- Oedema of the subcutaneous tissues. Ascites,- Dropsy of abdomen (Cerrus cavity).

There are collections of fluids in some of the organs of the body, which receive different names, viz/ Of lung, hydrothorax;. of pericardium,- hydropericardium; of uterus,- hydrometra; of testes, hydrocelo, etc.

I wish to say a word about flabby muscles. Many times we find this condition existing and it is well for us to know what brings it about. In most pathological conditions, if we are familiar with the cause, they are handled more readily than when we are not. I have heard the statement made that when we find flabby muscles the disease has progressed very considerably. My idea is that it has not. Again we are aware of the fact that the nutritition of the tissue elements is largely under the control or influence of the nervous system. That acute disturbance of nutrition is the result of irritation of the nerve trunks and centers. Intense changes of nutrition are common in acute inflamation of the spinal cord. There is a very close connection between irritation and inflamation, and if the irritation is in the proportion to be called intense it can then be used interchangably with inflamation, as it will soom cause an inflamation. In intense irritation an effusion may occur around the joint and then pressure symptoms are sure to follow. It is not known for certain that there are special trophic nerves, but this much is certain, that a lesion of the motor nerves of a part causes the muscles of the part to deteriorate. At first, so says Gowers, there may be merely flabbiness of the muscles and an appearance of wasting not confirmed by actual measurements.

2 If these lesions lead to degeneration of the nerves then in a couple of weeks the muscles show it in that they become smaller. There is one thing to be remembered in this connection, that with tese trophic or nutritional changes you find contracture associated with it. Then it is that we know the disease has progressed to a considerable extent. 3 That can be explained in this way.

1st. Any cause that leads to degeneration of motor nerves leads to nutritional changes.

2nd. These changes are shown both in the muscular fibers and the interstitial connective tissue elements. The muscular fibers because of the lack or rather disturbed metabolism shrink and sometimes become one-third their former size. While this is taking place the nuclei of the connective tissue and of the sarcolemma are increased. This develops into fibers of new connective or scar tissue. This scar tissue, if continued for any length of time leads to contraction, hence you see where the beginning of the lesion is shown by flabbiness the continuation leads to a contracture. If a lesion can be removed, the nerve may be caused to regenerate, thus the muscle begins to grow back to its former size. Many times the contracture of this interstitial scar tissue is such that the muscle cannot regain its former size and tone. While if there is no regeneration of the nerves it will ultimately leave nothing but what is called fibrous tissue and the contraction of this leads to permanent shortening. The traumatic muscular action on the tissues must not be forgotten. Especially an injury to the intestines by an action of the diaphragm. Gowers states that the violent action of muscles attached to the spinal column has appeared at times to be the sole agent in producing an acute inflamation of adjacent parts of the spinal cord. I have a case that seems to be directly tracable to violent muscular action and a strain.

It is stated by some that the Psoas muscle may act on the sigmoid flexure, but it seems rather that its action would be on the nerves of the lumbar plexus. This may lead to serious inflamation It is also known that strong muscular action at times produces neuritis. These inflamatory conditions may be slight or very serious.

Some points for expansion:

1 How do we stimulate,- alternate pressure and relation.
2. How do we inhibit?
3. Continuing the thought about the tendency toward the normal in treatment, followed by the question of effects of treating tissues that are seemingly healthy in connection with the abnormal.
4. How often must we treat, asthma, constipation, etc.
5. Relation between superficial and deep blood vessels.

LECTURE 21 - 1
EXAMINATION OF HEAD AND FACE.

Landmarks of Head and Face: Holden and Gray:

The scalp is dense and tough because of its close connection with the cranial aponeurosis. This denseness obscures diagnosis of tumors on the cranium. Every tumor that cannot readily be removed must be looked upon with suspicion, while those readily removable are not considered so serious. The first kind may be from the brain itself(Speak of erosion of bone by tumors).

Scull cap: Average thickness about one-fifth inch. It is thinnest over parietal bones, thickest over occipital protuberance. Although the scull cap is rarely symmetrical because of the prominence of the frontal and parietal eminences, and of the occipital region, these eminences are a general indication of the development of the corresponding lobes of the brain. To ascertain the relative proportion of these regions, pass a line from one auditory muscle to the other over the frontal, parietal and occipital regions respectively. The brain corresponds in general to these parts and would show the comparative bulk of the brain.

Fontanelles: Anterior one in the infant is very noticable at junction of sogittal and coronal sutures, caused by incomplete ossification of frontal and parietal bones. Posterior fontanelle where? If too prominent shows the fluids of the body too plentiful as in Hydrocephalus. If a hollow, shows a wasting of the fluid as in diarrhoea, etc. You may count the pulse of a sleeping infent by the eye. I have done so many times at the anterior fontanelle. In scull cap I want you to notice the frontal and parietal eminences especially as shown in a rickety skull, they are much more prominent and well marked, preserving a greater curve of the bones. This gives to the forehead a high, square and projecting look and sides are more square because of greater curvature of parietal eminences and is preserved into later life. More apparent in negroes.

Further the frontal sinuses, these are formed by separation of the two tables of bone not developed until puberty. May be formed by the inner wall of scull encroaching on the brain, no external showing. A large bump may only be a degeneration and consequent heaping up of bone, as shown in some Australian sculls. Mastoid process just behind the concha and its nipple like ending about on a level with the lobule of the ear. This is filled with

air cells livid with mucous membrane and is subject to catarrhal conditions which may lead to the formation of pus and demand trephining. The frontal sinuses are similarly lined and liable to disease. (nasal catarrh, etc.) The occipital protuberance is the thickest part of the skull, about three-fourths of an inch and marks torcular herophili internally.

The auditory canal runs inward and forward, therefore, to examine the canal or membrana tympani. The auricle must be pulled upward and backward.

There are at least two points I wish you to notice, one that might be of medico legal value to you. That is, the presence of fissures that might be mistaken for fractures. In fissures it is generally noted that they extend from the margin toward the center of the bone, while gaps may be found in the middle as well as at the edges.

In fractures the outer table may be injured and inner table not. Again the inner table may be fractured and driven inward without fracture of outer table. (Two reasons. First, thinner and more brittle. Bone bends and spreads, presses particles together on convex and forces them asunder on concave (inner table). Second, nothing firm under it to support it and oppose force.)

Arteries of scalp. The supraorbital artery can be felt beating just above the supra-orbital arch. Temporal just in front of the ear about one inch and a quarter behind the external angular process. The occipital near the middle of a line drawn from the Occipital protuberance to the mastoid process. Posterior auricular near the apex of the mastoid process. Middle Meningeal internally, about one and one-half inches above zygoma.

On face: Points of termination of the 5th nerve, supraorbital, infraorbital and mental foramina. The two lower look toward the angle of the nose. (About passing line between the two bicuspids). The inferior dental nerve may also be reached by pressing in just behind the angle and ramus of inferior maxillary bone. These terminations are important to us because we get important effects on the 5th nerve through them. Then it is necessary in this connection to note the condition of the lower jaw. It may be slipped backward or forward or to one side, thereby causing a tightening of the surrounding tissues and trouble with the 5th nerve. May be a potent cause of facial neuralgia.

press just beneath the internal angular process of frontal bone, the pulley for the superior oblique muscle can be distinctly felt.

A line drawn from the bottom of the lobe of the ear to midway between the nose and mouth marks the course of the parotid duct to opposite the second upper molar tooth it opens into the mouth. It is accompanied by the branch of the facial nerve which supplies the Buccinator muscle.. (7th N.-Its emergence and division; Liability to paralysis and cause.)

The eyes. They vary in size somewhat in different individuals and races but most of the apparent difference is due to the difference in size of the opening between the eye-lids. (Example, narrow slit of Chinese and Mongolian races, and wider opening of European races.) Notice the external angle is higher than the internal . This helps to give the face a pleasing expression and an arch. Raise the lids by placing a pencil over them and lifting the lid over it by the eyebrows. Notice perpendicular arrangement of

Meibomian glands on the tarsal cartilages. May have to use an oblique light to reveal objects fastened in the cornea.(How eye rolls upward and inward when closed.)

Lips: Judge of the condition of the circulation of the blood and even character by noting the color of the vermilion border..

Schiller says,- "It is an admirable proof of infinite wisdom that what is noble and benevolent beautifies the human countenance; what is base and hateful imprints upon it a revolting expression." We will not say how much the study of Physiognomy is really worth, still we all unconsciously notice the features of a stranger and judge somewhat of the man.

The muscles are generally described as arising from the bony fabric of the face and inserted into the nose, lips and corners of the mouth,but then every point of the face has some muscular fiber to it so as to be moved. So that continually recurring thoughts or particular modes of life stamp themselves on corresponding stes of muscles, giving permanent casts to the features. To this we all unconsciously pay homage and in fact is rarely misleading.

Arteries of Face. The facial can be felt as it passes over the body of the jaw, a notch indicating exact spot, near the corner of the mouth close to mucous membrane, then by the saide of ala nasi. The cononary arteries are felt by putting the fingers on inside of the lips and pressing against mucous membrane. The facial vein does not fo llow the artery but takes a course from the inner angle of the eye to the notch for the facial artery. The temporal already spoken of can be felt between the root of zygoma and the ear.

Examination of Head and Face: In an examination of these parts it is hard not to include an examination of the neck, as irregulaities in the parts of the neck are sure to affect some of the centers in the brain or some part of the face. In our examination of the head these landmarks just given must be kept in mind. The size of the head and the nutrition of its coverings. The expression of the face must be taken into consideration. The expression is produced by the formation of creases. These are influenced by habits, mental tendencies, temperment and pathological processes that may be taking place within the body.

Some generalties: The face of the alcoholic is generally flushed and heavy and rather expressionless, the skin generally puffy and unhealthy looking.

In women, at menstrual period or when suffering from menstrual disorders, are often discolored under the eyes. In both men and women excessive fatugue and loss of sleep cause infra orbital discolorations. Splotches on the face may be from genital diseases. Puffiness under the eyes generally noticable in the morning may indicate renal lesions or the excessive use of arsenic. If this puffiness is unilateral it would likely depend upon some local inflamation. Again we may notice the color of a patient having jaundice. The yellowish green tinge of the skin in girls with chlorosis. The facial expression of children is very important to us. If in pain it has a pinched look about the nose and mouth. If pain is in the head the forehead is likely to be drawn in wrinkles. If the nose is drawn and pinched looking, likely in the chest If also the upper lip is raised the pain is likely in the abdomen. (The expression of the face of children from tubercular parents.)

There are also two prominent lines on the face many times, which I wish to call to your mind. As certain muscles c lled into

play either through pain or other causes, gives a certain set to the muscles. First, the linea nasalis, extending from the ala of the nose to the corner of the mouth. In children this would indicate abdominal trouble or inflamation of the bowels. In older persons some stomach trouble or disease of some abdominal organ, as liver. Second, Linea Labialis, extending from the corner of the mouth down onto the lower jaw. In children this would indicate inflamation of the larynx or the lungs. Of older people laryngeal or bronchial difficulty. Again difficulty of breathing. There are many other conditions that could be mentioned in this connection but you must look them up for yourselves.

The Mouth- Landmarks: The coronary artery may be wounded by a blow, mashing the lip against the teeth and gums. (Case of drunk man so injured, he swollowed blood then vomited it, this lead them to think he had some internal injury.) Wound hard to see.

The surface of the tongue: The appearance of the tongue is indicative of the general condition of the patient. The tongue should be well protruded for an examination as the back will give more information than the tip. Prof. Hare of Philadelphia states that very few conditions of the coating of the tongue are pathognomonic of any one disease. Many times local conditions produce the coating. These local conditions can generally be placed under three heads. This is for the development of coating. First, Immobility of the tongue. Second, mouth breathing. Third, fever. This dries the surface of the mouth by breathing and interferes with salivary secretion. We can also have decayed or ragged teeth, lack of cleanliness and smoking.. The surface of the tongue may be attacked by the various eruptive diseases. (Name some of them). The characteristic tongue of typhoid must be noted, but its characteristic appearance may not be noted until the disease has been easily classified by other prominent conditions.

In children there are two conditions which the tongue very clearly shows. First, mucous disease or chronic catarrhal processes. The tongue is broad and flabby with a gray coating, smooth and fairly moist. In several spots the epithelium has been shed, leaving red spots with sharply defined edges. These spots are said to be worm eaten in appearance. Enlarged reddened papillae appear in these areas. Second, Acute or sub-acute gastric catarrh. In this there is comparatively a light coating dotted irregularly by bright red spots, very numerous but not raised above the surface It is well to note the color of the tongue. There are characteristic appearances of it in cases of certain petsons being swollowed In carbolic acid, shrivelled and puckered into folds. Sulphuric acid; a parchment like appearance, white then gray, finally a black slough separates and leaves an excoriated patch.

In anaemia the tongue is exceedingly pale. In pulmonary diseases and cardiac it is livid and cyanotic on account of non-oxidation of the blood.

It is well to note if patients seem to have epileptic fits and no biting of the tongue ever occurs, the patient being a female, the probability is that these attacks are hysterical.

It is also generally true that bilateral atrophy indicates some disease of the twelfth nerve. Many times unilateral atrophy is from the same cause. (I will illustrate further on.)

The under surface a median furrow of each side of which stands the ranine vein. In the middle line of the floor of the mouth is the fraenum linguae. The orifice of the submixillary gland on each side of it. In some cases the fraenum is too short and the condition exists known as tongue tie Division of the ranine vessels in cutting for tongue tie may cause fatal hemmorrhage, hence the cutting as near the jaw as possible.. The pterygo maxillary ligament may be readily seen when the mouth is widely opened. It is a prominent fold running obliquely downward behind the last molar teeth. 7, A little in front and below this ligament may be found the lingual nerve. This nerve supplies the fore part and the side of the tongue for two-thirds of its surface. Hence if any painful affections of this part of the tongue, the patient may be troubled with severe pain deep in the region of the meatus of the ear. Ulcers, painful, on this part of the tongue may cause spasmodic contractions of the muscles of mastication. Both troubles are explained in this way. The pain is referred along the third division of the fifth nerve and the lingual nerve is a branch of the fifth nerve. 8 There may be a connection between the tongue and the occipital region, shown in an absess over the occipital region and wasting of one half of the tongue. Explanation: A man received an injury to the back of the head, apparently not very severe. Before long the right half of the tongue began to waste. It continued until scarcely half the size of the normal side. During this time it was noticed that an absess had formed on the same side of the occiput. Fragments of bone were removed. After removal of the dead bone, the tongue began to recover and in one months time was about the normal size. The pressure of this bone was on the hypoglossal nerve which leaves the skull through the anterior condyloid framen of the occipital bone. Hence the pressure was sufficient cause for the atrophy or the wasting of these muscles. Such cases illustrate the importance of remembering even small foramina and the structures they transmit as well as the intricate nervous connections.

The hard palate varies in height and shape, while it has been said that the arch is particularly narrow and high in congenital idiots. The soft palate next after the hard palate, in the median line posteriorly. The extension of this palate is called the uvula.

9 The tonsils: They are situated between the anterior and posterior arches. In a healthy state they should not project beyond the level of these palatine arches. They are in close proximity to the external carotid artery, on the outer side. Nothing between them but the pharyngeal aponeurosis and the superior constrictor of the pharynx.

Landmarks, Examination of the Throat: The walls of the pharynx are in relation with the base of the skull and the opper six cervical vertebrae. The arch of the atlas is almost on a line with the hard palate. The axis on a line with the free edge of the upper teeth.

To examine the throat well it is best to hold the nose ; so that the patient is compelled to breathe through the mouth. This will also cause the soft palate to be raised and the palatine arches to be widened. The tongue should then be pressed downward slightly with some instrument, a spoon shaped instrument or a pencil. The tongue resists rough treatment so be gentle in your work.

Hence the upper vertebrae can be examined on their anterior surface through the mouth and throat and a posterior pharyngeal abscess may be noted. (This generally due to caris of the vertebrae) One thing yet in connection with the tonsil. 9, Deafness is often complained of when the tonsil is hypertrohied or enlarged. Remember this is not due to direct pressure of the enlarged mass causing closure of the eustachian tube. The deafness is due rather to the extension of the hypertrophic process to the lining membrane of the eustachian tube. Note that the hearing is not improved until some time after the removal of the tonsillar trouble. On the roof of the mouth we may feel the pulsation of the posterior palatine artery.

In cases of lock jaw it is well to know that there is behind the last molar teeth a space sufficient for the passage of a small tube into the mouth. This may be used for liquid feeding of the patient. Because of the looseness of the structures of the throat whenever there is inflamation there may be a very oedematous condition. At such times the uvula may hang down considerable thus being a source of irritation and cause a constant coughing and the trying to clear the throat of the offending mass. This hawking and coughing has a very deleterious effect on the throat. Should be treated soon.

LECTURE 23 - 1

Examination of Nose and treatment of Head and Parts:
Landmarks and examination of nose and nsal cavities: The externar aperature of the nose is a little lower than the floor of the nostril, so that the point of the nose must be pulled up to inspect the cavities. The line where the cartilages and the nasal bones come together can be readily felt. All of you are perfectly conversant with the fact that any inflamation on the nose, as boils etc., are very painful. This is caused by the tenderness of the part which prevents it from swelling without producing a great deal of pressure on the nerves. It is well to examine the nasal bones as they may be fractured, especially the lower one third where they are thinnest and least supported.

To examine the nasal cavities anteriorly the head should be thrown back and the nose drawn upwards. Looking into the nostrils, we find in the majority of cases that the left nostril is narrower than the right. This is caused by deviation of the septum to the left. There may be a whole through the septem and not indicative of disease. We can get a good view of the end of the inferior turbinated bone. In examination of the posterior nares with the finger it is necessary to throw the head well back. In this position most of the pharynx in front of the basilar process comes beolw the level of the hard palate and can be seen as well as felt. You introduce the forefinger behind the soft palate and turn it upward toward the base of the scull. You can then feel the concour of the posterior nares and satisfy yourself if polypi are present. A good way to examine the nose internally and to see the posterior nares is as follows. A small mirror, similar to that used in laryngoscopy must be introduced behind the soft palate through the mouth and illuminated from the mouth. The following parts may be seen under favorable circumstances: Posterior nares, the septum, the middle turbinated bone, part of the superior and inferior turbinated bones and part of the inferior meatus. The middle meatus is well seen as is also the eustachean tube. Most of these parts

may be felt by introducing the finger through the mouth behind the soft palate.

Rhinoliths are most often found in the inferior meatus.

The mucous membrane varies in the differ nt parts of the nasal cavities. Very think and vascular over the lower part of the septum. The nasal floor and betwen the turbinated bones is much thinner. Over the lower turbinated bone there is a rich submucous venous plexus forming a cavernous or erectile tissue. This might be to warm inspirent air; this may be also one cause of epistaxis. Also a connection with the nasal veins and superior longitudinal sinus. Hence we see that epistaxis is generally caused by an interference of venous circulation. Cervical tumor, paroxysms of whooping cough, etc., may cause epistaxis.

Treatment of the Head, Face, Nose, Mouth, Throat and Tonsils.

It seems that the necessary thing is to understand the nervous connections in this region to some extent. The blood supply of these parts is familiar to you.

By some it is claimed there are vaso-motor nerves to the brain by others that such is not proven yet we know the circulation to the brain is greatly affected by the general external circulation. Anaemia or asphyxia of the brain will affect the vaso motor center in the medulla and constrict the vessels of a large area and thence more blood is sent to the brain. The splanchnics are the vessels that seem to produce the most of this effect. Cut the splanchnics in a rabbit and it will soon die. So much of the blood will run to the abdominal cavity that the brain is drained of its supply and death ensues.

10. The cervical sympathetics contain vaso constrictor fibers for the corresponding side of the face, the eye, salivary glands and tongue, possibly the brain. Vaso dilator fibers for the face and mouth are in the cervical sympathetic leaving the cord from the 2nd to the 5th dorsal nerves and passing the face and mouth through the fifth nerve. The manner in which they do this seems to be that from the 2nd to the 5th dorsal they pass up the sympathetic chain to the superior cervical ganglion from thence to the gasserian ganglion. There may be some fibers in the 5th nerve itself.

The lingual and glosso-pharyngeal contain he vaso dilators for the lingual vessels. The sympathetic and hypoglossal contain constrictor fibers for the tongue, while most, if not all of these fibers arise in the sympathetics. Hence you see it is very hard to give much treatment for these regions unless the neck is included.

For alopecia or baldness: Stimulate all the nerves and blood vessels of the scalp. Look for lesion in the neck and also see if from traumetic lesions.

Occipital and Frontal Headaches. The nasal bones may be broken and we can very often fix them in proper position by manipulation and many times this is all that is necessary.

It must be remembered where we can treat the 5th nerve there may be a contracture of the structures around these places of exit and consequently a cause of irritation.

10 By treating the 5th nerve we can get vaso dilator effects on the face, mouth and tongue. This in a way affects nutrition of these parts. We must remember this one thing, that to work upon nerve terminals will affect the nerve itself and also the center

from which a nerve comes. The arteries of these regions should be looked after, that no clogging exists.

The blood supply of the carotids can sometimes be affected by letting the patient spring the jaw open while the operator holds the jaw. This sometimes gets an effect on the 7th nerve where it may be necessary to loosen all the structures around this nerve and remove pressure and the effects of a neuritis. Eczema and ulcers on the face and head may be affected by treatment on the nervesand blood vessels of this region, while the neck comes in for a good share of this work.

I should have mentioned the treatment we give in the occipital fossa for headache, also to stretch the posterior, recti muscles also ligamentum nuchae.

A treatment for the throat is a loosening of the muscles of the throat region and freeing the blood supply. When the trouble is very severe the nerves of that region must be strictly attended. Internally the throat may be very congested, which shows a clogging of the circulation of the part. The uvula in such cases is very likely to be inflamed and oedematous. This makes it very pendant obstructing the passage of the fances, and may be of such an irritating nature as to cause almost continual coughing. This would very likely call for an internal treatment, which is given as follows. (Tell them and show them.)

In nasal catarrh and colds you must remember it will be necessary to treat in the neck, but the treatment I will show you today will be about the head and face. Free the blood supply over the nose by loosening the tissues of the nose. Loosen the tissues that can in any way stop the nasal duct.

Over the frontal sinuses and press quite hard, also the nerves and tissues near the angle of the eye. This for a cold also The fifth nerve by supplyin the parts of the face with sensory fibers, is one of the tissues on which we hope to reach the greatest results.

LECTURE 24 - 1

Neck Landmarks:

First, it is very noticeable that the skin differs greatly in this region. The skin of the nape of the neck is very dense and adherent, while in front it is much thinner and looser.

Sub-cutaneous veins: The chief one is the external jugular. Its course is that of a line drawn from the angle of the jaw to the middle of the clavicle. The anterior jugular generally runs over the anterior border of the sterno mastoid.

Parts on Central Line: First, oshyoides just below and nearly on a level with the lower jaw, about on a level with the 3rd cervical vertebrae, some authorities s y the 4th. (Trace its conua.) Just below is the gap between the bone and the thyroid cartilage. This gap corresponds to the anterior thyrohyoid ligament and the apex of the epiglottis. Next below is the thyroid cartilageswe can find the lateral lobes of the thyroid gland. The isthmus, if any, connects the two lateral lobes and is generally covering second and third rings of the traehea. In front there is an interval between the thyroid and cricoid cartilages. It is occupied by the crico-thyroid membrane. The lower part of cricoid cartilage corresponds to about the 5th and 6th cervical vertebrae. A line drawn transversely across the neck from the cartilage would pass over the spot where the omohyoid crosses the carotid

artery.

Sterno Mastoid Muscle: Prominent landmark at its inner border overlaps the common carotid artery.

The sterno Clavicular joint: Over important structures. Apex of the lung. The lung rises into the neck further than we at first suppose, likely an inch to an inch and a half above the clavicle. This part of lung would be covered by the sterno-mastoid sterno-thyroid part of the scalenus auticus muscles, also the pleura.

Supra Clavicular fossa, the hollow above the clavicle where the external jugular ends. Not noticable at times. This is the point where we find the subclavian artery. The sterno mastoid and the scalenus articus come nearly together, hence the edge of the articus is the mark.

Posteriorly on the neck we find the occipital fossa. At the root of the neck the spine of the vertebrae prominens. Pressure deeply in the supraclavicular fossa will locate the transverse process of the 7th C. Pressure over the carotid vessels at the level of the cricoid cartilage, we find the prominent anterior tubercle of the transverse process of the 6th cervical vertebrae. This is know as the carotid tubercle.

Examination of the Neck:

It is well to examine the neck very thoroughly for the numerous nerves that arise in this region and the extensive nervous connections make it possible for lesions in this area the cause of great disturbances. I have told you once how to examine the back of the neck and locate the various vertebrae and the result of any misplacement.

There is often intense pain accompanying inflamations over the nape of the neck. This is because of the dense tissue and plentiful nerve supply. It is peculiar that this region of the neck is very commonly the seat of carbuncle. It can be noted in this connection that in this region the blood supply is not very extensive, but you must remember the body in all its parts is comparatively of slight vascularity in the medial line. Hence you must note the temperature of the neck region. This is likely to denote an inequality of the blood supply; that the vaso-motor nerves are not working properly. Especially is this region of the neck liable to considerable fluctuation of temperature. One thing may be that it is about the place where covered and uncovered parts of the body meet. Yet it is very likely that contractures are present in this region or in the throat which may affect the vaso motor center. If so these different area are bound to suffer. Also the blood supply to the brain may be affected by mechanically shutting off the blood supply.

It is known how we may recognize fracture, crepitus and abnormal mobility. There may be a fracture of some of the vertebrae, not very likely, yet the clavicle may be fractured and cause trouble to some of the surrounding structures. This may affect the brachial plexus as also any difficulty with the four lower cervical vertebrae. The contracture or some muscular trouble may also affect either the cervical or brachial plexus.

Any trouble to the vertebrae may affect the cervical sympathetic ganglia. Where there is any trouble with the atlas or axis there is very likely to be sore spots in the occipital fossa or it is expressed at the base of the brain. This would indicate that

the sub and great occipital nerves are affected. In an examination of the neck it is well to examine the skin and superficial structures.. We have noted the temperature next to the superficial veins. Put the sterno mastoid into action or the finger over the middle of the clavicle at lower end of vain and bring it into view. The anterior jugular runs along the anterior border of the sterno-mastoid muscle. These veins must be examined in all respiratory disturbances, especially dyspuoea. In tricuspid regurgitation there would be a venous pusle seen. In anemia, we could hear, by the aid of the stethoscope a venous hum or musical note in these veins. In examining the throat under the angle of the jaw we many times find much tenderness and soreness. This is said to be a sure indication of catarrh, but be very judicious in the use of this.

We may find the hyoid bone broken. The muscles of the hyoid region may be contracted and the contracture must be removed as it may mask the detection of greater difficulties. Good points to watch id we suspect the hyoid bone being broken, are difficulty and pain on speaking, in moving the tongue. Other symptoms, on opening the mouth and swallowing. Between a part of the thyrohyoid membrane and the hyoid bone is situated a bursa. This may become enlarged and form a cystic tumor in the neck. In examining the thyroid gland it can generally be felt by the side of the thyroid cartilage. Holden states that here we can, on the upper and front part of the gland, distinctly feel the pulsation of the superior thyroid artery. This pulse and the rising and falling of the gland with the larynx when swallowing, gives the best means of distinguishing a bronchocele from other tumors. If the thyroid is enlarged it is well to notice the condition of the muscles in this region, also the position of the first rib and clavicle, if the rib is up and the latter down. This would bring to mind the examination of the lymphatics of the neck. So see if they are enlarged. This may show that they have a chronic sore throat. It may follow from frequent hyperaemic conditions, diphtheria or scarlet fever. Whatever the cause it must be found and treated, not so much on the lymphatics directly.

The sterno-mastoid muscle is the great surgical landmark of the neck. Turn the head to the opposite shoulder and the muscle stands out plainly. Its inner border overlaps the common carotid artery . By this is found the internal jugular vein. The vgus nerve is in the same sheath between them and a little behind them. (The course of the common carotid artery). About on a level with the cricoid cartilage the omohyoid muscle crosses this artery. In the angle between the posterior edge of the muscle and the clavicle the pulsation of the subclavian artery can be felt. It describes a curve in the posterior triangle. One end of the curve corresponds to the sterno clavicular joint, the other to the middle of the clavicle, rising as much as a half inch above the bone in the highest part. Just above the bone the artery may be compressed against the first rib.

The nerves, the superficial ones, may be represented by six lines all drawn from the posterior border of the muscle. (Give them.) The 9th, 10th and 11th nerves emerge from the jugular foramen near the styloid process. The course of the 10th I gave you. The 9th is under the edge of the jaw. The 11th or spinal accessory reaches the anterior border of the muscle at a point about an inch below the tip of the mastoid process and emerges from the

middle of the posterior border and enters the trapezius about the level of the vertebral prominens. The phrenic nerve from the 3rd, 4th and 5th cervical, begins about on a level with the hyoid bone and runs down to a point behind the sternal end of the clavicle. About the level of the cricoid cartilage, it is beneath the mastoid muscle. This muscle may be affected from paralysis or from spasmodic contraction, hence torticollis or wryneck. The trapezius and scaleni muscles may be affected. Irritation of some of the upper cervical nerves may be a cause. Why? When we have trouble with the scaleni muscles there might be accompanying lung or heart trouble, as these muscles may raise the ribs and there be a consequent irritation.

The cervical portion of the lung, that is, the apex, is very liable to tubercular disease. It should always be very carefully examined. We may ascertain its condition by percussion near the sternal end of the clavicle.

There may be cervical ribs. They may lead to errors in diagnosis. They may be mistaken for exostoses and where the subclavian artery passes over them an aneurism might be thought to exist. These cervical ribs are met with in all ages and sexes. Generally found on either side of the 7th C.V. They may be short or long. When they are long the scaleni muscles may be attached to them, and the subclavian artery pass over them and lead to the diagnosis of an aneurism.

LECTURE 25 - 1

Treatment of the Neck:

We have now completed our examination of the throat and neck, how do we go about removing the many difficulties found?

Where we find the neck in the condition to need a good treatment, it is my plan as well as that of a great many osteopaths to begin on the front of the throat or neck.

The structures in the median line must be relaxed first. This would include the thyroid and hyoid muscles. Place the fingers flat on these structures using the flat of the hand or the cushion of the fingers. Do not let the fingers slip around when you are treating on this region. You may move the tissues around under your fingers but do not let them slip. If you have ever had a treatment then you can understand how it feels to have them move their hands or fingers over the skin as if giving a rubbing to a horse. It seems as if they would take the skin off this region. So you must not be guilty of such work. Release all these muscles working them up thoroughly, then you can feel the condition of structures deeper.

Working toward the angle of the jaw, the next we would treat would be very likely the tonsils.. If the tonsils are any enlarged we can feel them by pressing in under the angle of the jaw. The fingers flat, pressed up well in the angle, the head turned so as to relax the structures as much as possible. Pull down on these structures on the throat with one hand and roatate the head with the other, work to relax all structures and also to mechanically affect the blood supply. I say mechanically because the contractures of these structures does mechanically shut off the blood supply. Again by our treatment here we may affect the blood supply reflexly. By means of impulses on the sensory nerves to the

vaso motor center, or a stimulation to the sympathetics of this area.

In treatment of catarrh we must put in some treatment in a similar way to treating the tonsils. Loosen all the structures as you did when treating the hyoid muscles. Then continuing our treatment on the lower part of the face, we would stretch the lower jaw. This can be done very nicely by putting the fingers on the inferior maxillary bone, the thumbs above, and pressing or springing the mouth open. Again, we may hold the jaw and let the patient spring the mouth open.. It may be necessary to reach Meckel's ganglion. This must be done by causing the pressure of other structures upon or through the nervous connections. The first way is by pressing up just under the molar bone. Second, by work on the terminals of the 2nd division of the 5th nerve.

In enlarged lymphatics there is some septic process goin on or an obstuction to the lymphatic flow. This may be from vertebral trouble. Again the clavicle may be down sufficient to obstruct the flow. Hence it is generally best not to put very much if any work on the lymphatic glands themselves but rather to remove the cause.

To raise the clavicle, have the arm of the patient against the side and pushed upward to relax the structures. Place one hand over the clavicle, grasping it, and then raise up on it while raising upward and outward on the patient's arm with your other hand, grasping the arm by the elbow for this purpose.

The 9th, 10th and 11th nerves. The tenth is accessible near its exit from the skull as well as along the carotid sheath. The 11th is accessible near its exit, also about one inch below the mastoid process near the middle of the muscle and also near the 7th cervical vertebrae. For torticollis it is necessary to look to the treatment of this nerve and the upper cervical nerves.. The sterno mastoid should also be treated. Give a twist or turn to the head and work against the muscle and in this way relax it. After having worked up these structures treat on until you have released all contractures to the spine. This we can do by giving a twist or turn to the head at the same time we work against the course of the muscle fibers. Another way is to stand at the head of the patient and loosen up the structures the way I show you.

I have shown you how to set an atlas. One way is to stand in front of the patient with their chin resting on your knee. Make the abnormality greater than the proper turn will throw it into place. You must be able to impinge the subclavian artery against the first rib; thumb in the subclavicular fossa near the middle of the clavicle, press slightly inward and press it against the first rib.

LECTURE 26 - 1

Landmarks and examination of the Ear:

The pinna, the outer part of the external ear,may be absent and there be but little diminution in the acuteness of hearing. The skin covering the auricle is thin and closely adherent. There is scanty subcutaneous tissue and very little fat, hence in inflamatory conditions the pinna is externally swollen and there is great pain because of the tenseness of the parts.

In chronic gout there may be deposits of urate of soda (called tophi) in the pinna. By some it is considered absolutely diagnostic

of scorfula if the usual hole made for a ring is convered into a vertical slit or the ring may even cut its way out.

The external auditory meatus, the inner part of the external ear, is about one and a fourth inches long. It passes forward and inward. It consists of an osseous portion, which is a little more than one half of the tube and a cartilaginous portion. The meatus is curved, the convex part of the canal is upward. The outer orifice is elliptical, hence it is best to have a speenlum of eliptical shape rather than round. To straighten the canal for the introduction, the pinna should be drawn upwards, outwards and backwards, or upwards and backwards.

The membrana tympani sets in the meatus obliquely. This causes the floor of the meatus to be longer than the roof and gives a good lodging place for foreign bodies that may have gotten into the ear.

No hairs or glands in the bony part of the canal. The cartilaginous part has sebaceous glands, many of them, which may be the seat of very painful, though minute abscesses. It also has ceruminous glands. These secrete the wax which may be excessive and block the meatus. There may be a lack of blood supply and too little wax secreted. Lacerated wounds of the meatus may bleed profusely. The reason of this is that wounds in cartilage do not close readily. The meatus may b come inflamed and lead to otitis externa.. The relations of the four walls. Extension of inflamation.

The Membrana Tympani is placed very obliquely. It is attached to a ring of bone deficient at its upper anterior part. This is filled with connective tissue. This may serve for a place through which puss may escape from the middle ear into the auditory canal. The membrane is concave externally, of a pearly gray tint. The membrane may be red from inflamation or yellowinsh from accumulation of pus in the internal ear. The deepest point of the concavity is called the umbo and is just below the center of the membrane and is the point to which the handle of the malleus is attached. The segment above the umbo is opposite the promontory and the two fenestrae, also the chain of ossicles. This segment is also well supplied with blood vessels and nerves. The membrane is not very elastic. This is shown by the slight gaping after puncture and is one of the chief reasons why perforations heal so very rapidly. (Coughing, sneezing, vomiting and concussions as of loud reports, rupture the membrane).

The middle ear, the Tympanum: Width one-twelfth to one-sixth of an inch. Skirting the upper and posterior portion of the wall is the aqueduct of Fallopins. This contains the facial nerve. Give boundry of cavity of Tympanum.

Mastoid cells are often the seat of suppurative collections caused by the spread of inflamation from the tympanum Inflamations here may involve the facial nerve, the membranes of the brain or the brain itself.

The Eustachian tube. The opening is on the anterior wall of the tympanium, about one and one-fourth inches long and opens into the pharynx. Its purpose is to supply the tympanum with air and so equalize the pressure on each side of the tympanum. If the tube becomes closed the hearing is dulled. There are two methods of inflating the middle ear. The first, known as Valsalva's , is as follows. The nose and mouth are closed, the cheeks are then

blown out, this produces a sense of pressure in the ears and the hearing is dulled. The change is due to the bulging of the membrana tympani by the air being forced through the Eustachian tube into the tympanum.

The second, Politzer's method; the patient's mouth is closed, a rubber bag filled with air is placed in one nostril, the nostrils are then held closed. The patient is then made to swallow a mouth full of water, at the same time the bag is emptied of the air. there is no means of escape except into the Eustachian tube. Deafness caused by enlarged tonsil and inflamation of the mucous membrane of the pharynx and other hypertrophic changes is due to the extension of the inflamation of the mucous lining of the tube. Pharyngeal growths and nasal polypi may mechanically close the tube. There are three conditions which are said to help magnify the sound as if in the middle ear. First, closure of the external ear. Second, closure of the Eustachian tube. Third, secretion about the ossicles not allowing free motion. If by placing a watch on a tuning fork when struck on the mid line of the skull, on the mastoid process, or between the teeth we can judge where the trouble lies. If the sound is increased on one side that is said to be the ear affected. If no sound is heard at all we can rest assured the trouble is with the internal ear.

N. The Chordo Tympani nereve may be implicated in the inflamations, cataracts, etc , of the middle ear. This may lead to anomalies of tase and trouble with the submaxillary and sublingual glands. As this nerve supplies these two glands with secretory and vaso dilator fibers and it also likely contains taste fibers from the fore part of the tongue.

The Internal Ear, the osseous labyrinth, is formed independently of the other parts of the ear. These are liable to disease even necrosis and expelling of the fragments.

Treatment: In the treatment of the ear it is well for us to take note of the blood supply and the nerves that innervate the different parts of the organ.

Pinna: Blood Vessels. Temporal, Post Auricular Branch of Int.Max. Nerves: Auriculo Temporal of 5th; Great auricular; Small Occipital Arnold's nerve of the 10th, called Alderman's nerve, The auriculo Temporal of the 5th and Arnold's nerve of the 10th to the Meatus.

Membrani Tympani: Blood vessels; Stylo Mastoid. Tymp.of Int. Max. Nerve: Auriculo Temporal.

The stylo mastoid is from the post auricular, hence the blood supply of the meatus, membrana tympani and auricle and are from the same general vessels.

Tympanum: Blood vesels; tympanic from Int.Maxillary, Int. Carotid. Petrosal from middle meningeal, stylo mastoid; branches from ascending pharyngeal.

Nerves: To muscles otic ganglion and facial; to the wall: is the 7th, 9th ans sympathetic; Chorda Tympani passes through.

The osseous labyrinth is supplied by the vertebral artery alone. The cervical sympathetic contains vaso constrictor fibers for the ear, while it is said that the 5th may contain the vaso dilator fibers.

Now as to our treatment. The meatus first, it may be the receptacle for some foreign substance, especially in children, and

these must be removed. Although Dr. Trevis asserts that more injury has been done in removing these substances than in letting them remain, yet there are times when it is absolutly necessary to remove them. Instance, a case from Hilton as given by Dr. Arnold. A child had introduced a bean into each ear during play. This had caused chronic severe vomiting. The connection was by Arnold's nerve of the 10th and the 10th to the stomach. (Explain Alderman's nerve.) If the case be one of impacted wax. It is just as essential to remove it. This can sometimes be removed, a portion of it, without wetting the wax. Generally best to use some warm water and this can be very warm. After the first treatment the ear is generally more painful from the swelling of the wax unless you succeed in cleansing it entirely. If insects, use some sweet oil and warm water or just the oil. This can be introduced with a syringe. Coughing, also sneezing may be caused by a plug of wax in the meatus. This by irritation of Arnolds nerve to the vagus. Also of yawning by a plug of wax, the 5th third division, the same one that supplies the muscles of the jaw. It is true we can do a great deal of our work on the ear through treatment in the neck. That it is possible to inhibit the auditory nerve by pressure about the 3rd cervical. This work can be done very readily by the nervous connection through the cervical sympathetic.

The difficulties following scarlet fever, measles and diphtheria are generally very readily handled by removing the contractures in the neck and freezing up the blood supply, also by stretching the jaw.

Constitutional troubles may be causing the catarrhal condition of the ear. Then these troubles must be treated accordingly. Tinnitus aurium may be from such causes or cases of malnutrition sometimes due to the stoppage of the circulation. Then our method would be to stretch the jaw, free up the branches of the carotid artery and establish a good circulation.

Misplacement of the first and second cervical vertebrae atlas or axis is very likely to cause trouble with the ear. I remember seeing a case where misplacement of axis caused a discharge from the ear and a very marked deafness. Just in proportion to the righting of the misplacement the hearing returned and the discharge from the meatus was lessened. I have shown you how to set these vertebrae. You must remember that many times the membrana tympani may be perforated and yet the person can hear. A very good plan for you to find if there is a perforation is to place three or four drops of glycerine into the ear. By turning the ear upward it will make its way into the mouth and the patient recognize the face.

Catarrh of the nose may extend to the membranes of the ear and cause deafness. In such cases the circulation to the throat, nose and ear must be looked after closely, also the nerves of these parts nust be stimulated or freed from any obstruction. This was shown you in treatment of the neck and head.

It might be possible that you could find a case of deafness which could be cured without treating the ear at all. There may be a lesion as low down as the clavicle, hence you see it is just as necessary to look for the lesion and remove it in ear difficulties as any other. One way you may use to stimulate the blood supply is to move the auricle up and down, back and forth, also to get

the finger into the glenoid fossa as near as you can. This can be done just as well behind the inferior maxillary articulation. It yet remains that we do our chief work to the ear by way of stimulating or freeing the blood supply and treating the superior cervical ganglion of the sympathetic.

Pain in the ear, in the meatus or on the pinna may have different origins. Remember the distribution of the nerves in meatus and pinna and their origin. Then you may trace by means of these to the seat of trouble. (Case of enlarged gland at 2 C).

Lecture 27 - 1.

THE EYE.

Landmarks and Examinations: The eyeball is contained in the orbit, a bony cavity. It is imbedded in fat in the orbit, a membranous sac which isolates it from the fat and allows the eye free movement. The tutamina oculi, (the appendages) include the eyebrows, eyelids, conjunctiva and the lachrymal apparatus (name them Lachrymal gland, sac and nasal duct).

In the landmarks of the face mention was made of the eyelids and the fissura palpebranum, its giving the peculiar look of the eye to the different nationalities. The eyelashes are attached to the free margin of the lids, those of the upper lid curve upward, of the lower downward, so they do not interlace in closing the lids Near where these lashes are attached are the openings of numerous glands. 13 Sycosis, an inflamation of these hair follicles and some of these glands, is one of the most common of opthalmic afflictions The common stye is also a suppuration in the connective tissue or one of these marginal glands. One cause of these troubles is that the circulation here is terminal and stagnation in the blood current is not hard to produce. Remember this that the junction of skin and mucous membrane is apt to be the seat of irritative afflictions. There are many transverse folds on the lids. One on the upper lid is deeper and more marked than the rest. The part below this transverse ridge covers the globe of the eye, the part above being in relation with the soft structures of the orbit. When the eye becomes sunken in emaciation the lid becomes much sunken in the line of this fold. While the sunken eye denotes absorption of the fatty cushion or loss of the vital fluids, as from loss of blood, etc.

Puncta lachrymalia: Near the inner angles of the lids we can see the puncta lachrymalia as two little black dots. These puncta openings is somewhat backward to receive the tears. They lead into the lachrymal sac situated at the side of the nose. In front of the sac is the tendo oculi. By forcibly drawing the lids outward this tendon can be seen or felt. Epiphora, or overflow of teers are due to two principal causes. First, any obstruction to the lachrymal passages Second, any cause that removes the lower punctum from the globe of the eye, viz., ectropion, entroption, swelling of lower lid, etc, also facial palsy. The lachrymal sac is supplied by the infra trochlear branch of the nasal nerve and affections of this sac are very painful so it might be well to remember its nerve supply.

The conjunctiva: This is the mucous membrane of the eye. The ocular portion is loosely attached and not extensively supplied with blood vessels. The palpebral portion is thicker, more closely adherent and more vascular. The vessels of this region are very feebly supported. Hence sub-conjunctional hemorrhages may occur from sever vomiting or during a paroxysm of whooping cough. This is because of the tension put upon these vessels from the strain of the coughing or vomiting. 14 Hemorrhages under this membrane can be told from bruises because of their scarlet color. This is due to the thinness of the conjunctiva which allows oxygen to reach the blood and in this way retain its arterial character.

The glands of the palpebral conjunctiva may become inflamed and little granulations appear. These may be enlarged mucous follicels or hypertrophied papillae. This condition is know as granular lids. It may lead to the formation of cicatricial tissue and cause inversion of the eyelids. In the examination of the conjunc-

tiva, when it may be red and engorged with blood you must note if the congestion or inflamation is actually in the conjunctiva or the circum corneal zone. If the inflamation is of the iris and the adjacent parts and around the margin of the cornea, there will be a narrow pink zone of fine vessels around the edge of the cornea. They are parallel, closely set and do not move with the conjunctiva It is called the zone of ciliary congestion. If the inflamation is of the conjunctiva, the vessels are tortuous, of comparatively large size and of a bright brick red color. They are easily moved with the conjunctiva and emptied of their blood by pressure. These points serve to distinguish inflamation of the conjunctiva from that of the deeper structures. You may note a yellowish color of the eye indicating some hepatic trouble. Again there may be the pale color of anaemia.

We may notice the brilliant eye of the consumptive. In fevers there may be a dull eye or again the glassy eye, which is indicative of dangerous state of patient. In children if the glassy eye is noted it would indicate inflamation of the mesenteric glands. If this is also accompanied by dark lips and tongue and great restlessness, then an acute inflamation of the stomach. Eye in Exopthalmic Goitre?

By turning back the lids the meibomian glands may be examined and their condition noted. In examining an eye there may be conditions found such as the following: The sight retained except in one certain part of the eye. The visual field seems to be destroyed only toward the ouer edges. Again the constant lessening of the visual field from outward in. These points may be explained as follows: Lst. The retina has a vascular system of its own in no way connected with the choroidal vessels except at the entrance of the vessel to the optic nerve. Hence if some branch of the retinal artery becomes plugged as in a case of embolism or from any cause the patient would be derived of vision in the part of the retina supplied by that branch of the artery. Second, if such a condition was brought about on the vessels supplying the inner part of the visual field, there would be no sight in that part of the retina. Third, the condition spoken of when the visual field is gradually lessened is many times caused by intraocular tension. This is brought about by an excess of fluid retained in the eye-bal (explain) The sclerotic coat is unyielding, the distended eyeball is pressing against this covering and the retinal blood vessels are among the first to suffer compression, those at the periphery. Hence this would gradually shut off the sight. (Glaucoma) Pressure on the optic nerve is likely to produce flashes of light and other abnormalities of sight. There is one thing which most Osteopaths do in the examination of the eye and that is to ascertain the condition of the pupillary reflex, or the iris reflex, whichever you wish to call it. To determine this condition just close the eye put a finger upon it, then tap a few times with a finger of the other hand, open the eye and if this had cause the iris to dilate the reflex is intact. Again you may close the eye to the light and then open it suddenly and note if the reflex is present. You must watch the eye very closely in such examinations and if this reflex cannot be noted, I would never promise a thing on such an eye. In our examinations we should note if there be a growth of the conjunctiva called a pterygium. (Explain). Again there may be a growing opacity of the cystalline lens or its capsule, known as a cataract. Again, there is in many eyes a too plentyful secretion of

this whitish substance at the inner canthus of the eye. Just internal to the puncta lachrymalia is a depression. This is filled in with a conical shaped body called the caruncula lachrymalis, This is the origin of this whitish secretion and these glands may hypertrophy and cause a greater amount to be secreted than normal. Again there may be a condition in the myopic known as muscae volitants due to little particles of opaque matter floating in the vitreous humor.

We notice that the blood supply of the eye is fom the internal carotid artery by way of its opthalmic branch. As mentioned above the arteria centralis retinae has very little if any connection with the other arteries of the eye. Hence if by any means of this arterly was to be come plugged there would be instant blindness.

The Lachrymal Gland, Situation etc. Note the lids, conjunctiva, iris, changes in ball and sight and seat of inflamations.

The eye is a nervous organ and yet is plentifully supplied with nerves which control its motions and its nutrition. The bony orbit in which it is placed affords it an excellent protection, while its position is such as to obtain the most extensive range of sight.

In our lecture on centers several points of importance were given that governed the eye. There is a broad field on which to work, especially as we have the 3rd, the 5th and the sympathetic nerves that we may affect. It is true also that the 4th, 6th nerve sopply each one muscle of the eye, yet they are not of such interest as the preceeding ones mentioned.

16 I will first speak of the 3rd nerve, the motor oculi. It supplies all the muscles of the orbit except the superior oblique and the external rectus. Through its connection with the ciliary ganglion it supplies the sphincter muscle of the iris and the ciliary muscle of the eyeball If there was paralysis of the nerve there would be dropping of the upper lid (ptosis); the eye would be almost motionless and a divergent squint. The pupil would be dilated and fixed and the power of accomodation impaired. Hence if we wish to affect the muscular mechanism of the eye to tone it up we must get an effect on the 3rd nerve. Of this we will speak at the next lecture. But it must be remembered that the effect the 3rd nerve exercises over the sphincter muscle of the iris is through or by way of the ciliary or opthalmic ganglion. These fibers of the iris are arranged in a circular manner and stimulation of the 3rd nerve through the ciliary ganglion leads to a contraction and consequent lessening of the size of the pupil.

The control which the 3rd nerve exercises over the ciliary muscle is also by way of this same ciliary ganglion. This muscle in no way affects the size of the pupil but is concerned in the process of accomodation of the eye. Hence we can see some of the importance of the ciliary ganglion which will be considered in our next lecture.

LECTURE 28 - 1

The Eye-Concluded

The ciliary, ophthalmic or lenticular ganglion bears a very important part in relation to our work on the eye. It serves as a center for the supply of nerves, motor, sensory and sympathetic, to the eye-ball. Hence any effect on this center is dure to be noticed on the eye. It may be well to note the formation of this center. Its situation is at the back of the orbit to the outer side of the optic nerve, generally in contact with the ophthalmic artery.

The formation of this ganglion is as follows: The short root the motor one, is from the 3rd nerve and joins the ganglion at the bottom. The effect of the 3rd nerve on the iris and ciliary muscle is maintained by this short root of the ganglion. The long root, the sensory one, is from the nasal branch of the ophthalmic division of the 5th. When speaking of the 5th nerve we will then give the effect of this root on the eye. The middle root is a very small nerve which eminates from the cavernous plexus the sympathetic. This is known as the sympathetic root. Let us see the course of these fibers and their effect on the eye. Quain states that the ascending branch of the superior cervical ganglion of the sympathetic, goes to the formation of the carotid and cavernous plexuxes. The cavernous plexus on the inner side of the carotid artery extends to the ophthalmic and cerebral arteries. There is one minute plexus which enters the eyeball with the arteria centralis retinae. Besides these branches, is the smypathetic root to the ciliary ganglion. What is the function of this root? In our last lecture we stated that the motor oculi through the ciliary ganglion causes constriction of the iris and consequent contraction of the(eyeball) pupil. The American text book of Physiology says: The constrictor influence exerted by the 3rd nerve on the iris is antagoinzed by the sympathetic fibers ~~of the iris.~~ He states further that the course of these fibers is from a center which lies in the floor of the 3rd ventricle, not far from the origin of the 3rd nerve, then passes through the bulb, the cervical cord, the anterior roots of the upper dorsal nerves, the upper thoracic ganglion, the cervical sympathetic nerve as far as the upper cervical ganglion. From here it passes up the carotid artery to the gasserian ganglion and on its ophthalmic branch and by way of its nasal division and the long ciliary nerves to the eye. Hence we note that the iris is under the control of antagonistic sets of nerve fibers. Both of these sets are normally in a state of tonic activity. 1? Therefore when the sympathetic nerve is divided the pupil contracts. Why? 1? Section of the motor oculi causes dilation of the pupil. Why?

The constitution of the cervical sympathetic is as follows according to Quain: 1st. Pupillo -dilator fibers from 1st, 2nd and 3rd dorsal nerves. (How reach eye). It is stated by some that pupillo-dilators are contained also in the 7th and 8th cervical nerves. 2nd. Motor fibers to the involunary muscles of the orbit and eyelids from the highest four or five dorsal nerves. Explain why the upper lid drops and the eye recedes in the orbit when the cervical sympathetics are paralyzed. 3rd. Vaso motor fibers of the head starting from upper dorsal. 4th. Secretory fibersof submaxilliary gland, from upper dorsal. 5th. Pilo motor fibers of face and neck from upper dorsal. In all these groups where the fibers of spinal ordain terminate, and the fibers of the sympathetic

arise, is in the superior cervical ganglion. Hence the importance of the ganglion to the osteopath.

The misplacement, dislocation or a slip of the upper three cervical or upper three dorsal vertebrae is sure to produce effects on the eye. In our examinations especially should we note the condition of the atlas and axis.

19 We will now consider the 5th nerve and its effects on the nutrition of the eye. This nerve is also the source of the sensory fibers of the eye.

The ophthalmic, or first division of the 5th nerve is altogether sensory in function, it supplies the eyeball and the lachrymal gland, the mucous membrane of the eyelids and eyeball and the upper lid. The lower lid is suppiled by the 2nd division of the 5th. The first branch of the fifth nerve connects with the 3rd and has numerous branches of connection with the sympathetic.

We have demonstrated the influence of the nervous system on nutrition, but it seems necessary to notice the effect on the eye of the fifth nerve, in this regard. Kirke says that some physiologists believe in special trophic nerve fibers, and that experiments in this line have been chiefly worked out with the 5th cranial nerve. Especially the effect on the eye. He further states that division of the nerve causes loss of sensation of the corresponding side of the face. The cornea soon changes from slow inflamatory processes, which may eventually lead to a destruction of the whole eyeball. Green in his pathology states that intra cranial section of the 5th nerve causes cloudiness of the cornea in twenty four hours and often destructive panophthalmitis. From the above, the trophic influence of the 5th nerve on the eye is readily seen. The eye is prone to undergo inflamatory changes with very small provocation, hence the necessity of noting the inferior maxillary articulation, as an irritation at this point readily affects the 5th nerve.

The American Text book of Physiology states that excitation of the cervical sympathetic causes constriction and excitation of the thoracic sympathetic dilatation of the retinal arteries. In another part of the lecture was noted how these fibers connected with the 5th nerve because most or all of the fibers of the anterior part of the eye are found in the fifth nerve. Some are from its numbrous nervous connection which we have mentioned while others seem to rise in the trigeminus itself.

Treatment of the eye: From the foregoing we note two facts that the eye may be influenced either through its blood supply or nervous supply. As the blood supply is under control of the nervous system, our work would principally by means of its nerve supply. These are found in the 3rd, the 5th, the ciliary ganglion and the sympathetic. The sympathetic control is mainly through the superior cervical ganglion. Herpes, flushing, pallor, lachrymation and salivation all indicate some disturbance of the sympathic and trophic fibers contained in the 5th nerve. It is also noticed that stimulation of the sexual organs produces protrusion of the ball.

How to reach the 5th nerve: We may reach it at the points of termination on the face, viz: supraorbital, infraorbital and mental foramina. At the angle of the eye, the inner canthus, we can readily affect the nerve. Also by the shock over the frontal sinuses and the forehead. The frontal sinuses are supplied by the 5th as well as the skin over this region. Again we may rrach the 5th

nerve at the inferior maxillary articulation. Hence this should be examined closely and any abnormality corrected. I have shown you how to spring the jaw. There may be a pain in the eye from cold in the head, through the connection with the nasal nerve. Loosen the structures and treat as if catarral condition existed.

I have given you the position of the cilliary ganglion. We may exert pressure on it by putting the finger on the eyelid over the eyeball and pressing backward. The question was asked could we affect a center other than reflexly. If there is one place where we do affect a center directly it seems that this would be the point and this ganglion the center. By so doing we may affect the optic nerve. We may also mechanically affect the blood supply The roots of this ganglion comprise three nerves and we can thus strengthen or tone up the muscular mechanism of the eye by the effect on the third nerve. By a gentle tapping over the eye the sympathetics may be stimulated.

I am certain the best results are obtained by treating the sympathetics through the superior cervical ganglion. I have given you a general treatment for this ganglion. Its numerous connections with the 5th and the control it exercises over the retinal blood vessels make it one of the most, if not the most, important points to affect the eye. The 2nd and 3rd cervical vertebrae must always be examined and, if necessary, righted. Here is where we may stimulate the ganglion by alternate pressure and relaxation, or inhibit it by removing sources of irritation and using steady pressure.

Granular lids:- We found how these were caused by a stoppage of the ducts of different glands on the eyelid or a stagnation in the blood supply. Congestion may cause a hypertrophy of them. The fingers may be oiled well with vaseline or something to make the fingers smooth. Put one finger on the conjunctival portion of the lid, with a finger externally, pressing the granulations between them you may crush them. Then the treatment must be applied to the blood supply, although primarily the nerves may be at fault, if so, I have told you how to reach them and the effects you can get.

Vaso constrictor center in sup. cervical ganglion. Also to constrict iris by way of ciliary ganglion. To dilate by the dilators from upper dorsal.

For granulations it is generally necessary to treat the points of termination of the 5th nerve and free structures around these foramina. Be careful to note any lesion in the cervical region. Dropping lids: You must treat the 5th and stimulate the blood supply. We must build up muscular tone as it is muscular or nervous by means of the nerves innervating the muscles, especially 3rd and sympathetic.

Crossed eyes: I have never treated a case. It may be due to loss of antagonism, either through weakness of the muscle or lack of nerve supply. So I am sure many cases may be successfully handled. (Case of D.R.).

Pterygium: I explained to you last lecture, and some of these growths have been removed by our method of treatment. By controlling the nutrition of the eye by means of the 5th and the superior cervical ganglion the growth may be absorbed.

Cataract: This is also a nutritional trouble. We would treat it through the 5th and the superior cervical ganglion. Be sure the inferior maxillary articulation is all right.

Dilate pupil at 2 or 3 D, vertebra.

LECTURE 29 - 1

THE THORAX.

Landmarks, Examinations and Peculiarities: The two sides of the chest are seldom symmetrical, the circumference of the right side is usually greater than the left. Explanation considered to be the unequal use of the upper limbs; In making these measurements do so on the plane of the nipple. Potts disease and other difficulties may cause the chest wall to be greatly deformed. Pigeon-breasted deformity: In this the sternum and cartilages are rendered protuberant. This is generally caused by some impediment to the entrance of air in inspiration. (Explain). (Rickety rosary. Both sides affected.)

There are three points of difference in female and male chesls In female, first, the sternum is shorter, making its capacity less. Second, the upper opening is larger in proportion to the lower. Third, the upper ribs are more movable. The top of the sternum is on a level with the second dorsal vertebrae. Hardly more than two inches between the sternum and spine. At the junction of the first and second pieces of the sternum, a transverse ridge can be felt upon the anterior surface. This is on a line with the second costal cartilage.

Parts behind the first bone of the sternum: No lung, it is occupied by the trachea and large vessels. The left innominate crosses just below the upper border. The great primary branches of the aortic arch. Deeper is the division of the trachea into the two bronchi, this takes place just about the junction of the first and second pieces of the sternum. The oesophagus is deepest of all.

The course of the innominate artery is from the middle of the junction of the manubrium and gladiolus to the right sterno-clavicular joint. Hence if higher than the ordinary we may feel the pulsation in fossa just above the sternum.

Internal Mammary Artery: It runs perpendicularly behind the cartilages of the ribs about half an inch from the sternum. The perforating branches supply the mammary gland. The one through the second intercostal space is generally largest. These all enlarge during lactation. This leads us to note the mammary gland which extends from the 3rd to the 5th rib. The nipple is situated over the fourth interspace about three-quarters of an inch from the junction of the ribs with the cartilages. This makes it nearly four inches from the middle line.

When any contracting growth, such as scirrhus drags upon the ducts of the gland, the nipple becomes retracted. This is why on examination of the breast for a cancerous or other growth the retraction of the nipple considered diagnostic of cancerous growths. Note if possible the condition of the circulation to these glands, as by this means the osteopath has achieved remarkable results, that is, by removing every obstruction in the way of the circulation

Interval below clavicle: This is a depression called the subclavicular fossa, a triangular interval between the deltoid and pectoralis major. In subclavicular or intra coracoid dislocation there is an eminence instead of a fossa. In this fossa is where we find the coracoid process and the axillary artery. In an injury to the shoulders, by carrying the arm outward you can stretch the two muscles spoken of and make the fossa show more plainly. Press the thumb in the space near the edge of the deltoid muscle and you can ascertain if the coracoid process be broken. To the

inner side of the coracoid process, corresponding to nearly the middle of the clavicle, we can feel the pulsation of the axillary artery and compress it against the second rib. (Explain). The axillary glands cannot be felt when they are in a normal condition. When the arm is raised from the side the axillary artery represents a line drawn from about the middle of the clavicle to the humerus, at the inner side of the coraco-brachialis.

Between the clavicle and the first rib we have the great vessels and the great nerve cords of the arm. The vein is the most internal in the acute angle of the first rib and clavicle, artery next and nerves outermost and around the artery.

Exostoses is the region likely to show pressure results (Explain Hilton Case.) Near here we can get effects on the parenic and vagus nerves, that is the sternal end. The clavicle may be broken by muscular action alone, and the seat of green stick fracture more than any other bone of the body. (Explain.)

Rules for counting the ribs: In fat people it is often difficult to count the ribs. Holden gives the following rules:

1st. Junction of first and second bone of sternum corresponds with the level of the cartilage of the second rib.

2nd. The nipple of the male is placed generally between the fourth and fifth ribs about three fourths of an inch external to their cartilages. (Female same).

3rd. The lower external border of the pectoralis major corresponds with the direction of the fifth rib.

4th. When the arm is raised the highest cisible digitation of the serratus magnus corresponds with the 6th rib. The digitations below correspond with the 7th and 8th rib.

5th. A line drawn horizontally around the chest from the nipple cuts the 6th intercostal space midway between the sternum and the spine.

6th. The scapula lies on the ribs from the second to the seventh.

7th The eleventh and twelfth ribs can be felt in corpulent persons even, outside the erector spinae, sloping downward.

8th. The sternal end of each rib is on a much lower level than its vertebral end. A line drawn from the middle of the third costal cartilage at its junction with the sternum would touch the body of the 6th dorsal vertebrae. The end of the sternum is about on the level with the 10th dorsal vertebrae. The length varies in different individuals and more in the female than in males.

The intercostal spaces are wider in front than behind and between the upper than the lower ribs. The third space is the widest. The first five are wide enough to admit the breadth of the index finger. The spaces are widened in inspiration and can be increased by bending the body to the opposite side.

Examination of the ribs: Some abnormalties of the anterior chest wall were mentioned in the beginning of this lecture. These will alter the position of the ribs, also any abnormal curve in the spine, as Potts disease, where the ribs may be drawn into peculiar shape and the spaces narrowed. If there is a paralytic chest it is flattened in front bulging more laterally. The chest of a child in rickets is just the opposite of the paralytic chest, that is, the sides are flattened and the antero-posterior diameter is increased. Any of you having once seen a typical asthmetic chest will at once note the bulging shape of the wall also the drawn up-

ward condition as if the neck was sinking down into the cavity of the chest. In emphysema the chest resembles that of the asthmatic.

These alterations in the chest wall are brought about by an alteration in the curvature of the ribs and are likely to cause misplacements or twists of the ribs and pressure on some structure.

Whenever examining a chest wall always examine for a dislocated, subluxated or twisted ribs. I use either the index or middle finger and trace the intercostal space. Ordinary pressure will not cause pain if no lesion. If we find tender points at the spinal and anterior ends and another about the middle region, our diagnosis would be a dislocated rib. The pain expressed at these points is explained as follows: Where dislocated at the spinal end there is likely to be pressure on some nerves and blood vessels, or to cause the impingement of ligaments on such structures and pain. These same intercostal nerves in their course give off lateral cutaneous branches and end anteriorly with a cutaneous branch, hence the irritation from the misplacement would cause the pain in these places. Many times the pain and tenderness may extend along the whole course of the nerve. I have found when such was the case that there was generally a twist of the rib or a contracture, causing pressure results and a raising or lowering of the rib.

You may find the ribs pressed together behind. This would likely cause a separation in front. The rib may not be dislocated but twisted, then you feel a sharper border than common. This would cause one rib interspace to be narrowed and the other widened. This you detect with your finger. The soreness and pain would be found accompanying. You must examine the cartilages of the ribs closely. (My experience with Mrs. C.) You may find some of these cartilages broken loose and if of the 10th rib, there would be three floating ribs instead of two.

You must know if the clavicle is in its proper position, then you may be able to come to a correct conclusion in regard to the 1st and 2nd ribs. They may be drawn upward by contractures of the scaleni muscles or drawn downward by means of the other ribs.

If the first rib is drawn upward the relative position of the rib and the clavicle is changed. The space is smaller. The second rib may be followed from its cartilage origin at the junction of the mamebrium and gladiolus, follow outward and examine the interspaces noting the sore places and we may correctly diagnose and then remove the difficulty.

The lower ribs are likely to be very oblique, denoting a neurasthenic condition, or the lower ones, the floating ribs, may be slipped down or up, or the points beat inward and cause intestinal trouble. (Case of Dr.H.) Many times these ribs may overlap or the spinal articulation may be misplaced. I gave you in a previous lecture how to stretch the quadratus lumbonum and it may be necessary to do this frequently where the lower ribs are down before you can get them to keep their proper location. This you must do, - get your fingers used to the normal and you may then readily detect the abnormal.

LECTURE 30 - 1

THE THORAX.

Examinations and peculiarities, concluded: It is best to lay the patient on the back, flat, for an examination of the anterior chest wall. It is best to make the examination next to the skin or at least through only a thin piece of cloth.

For an examination of the posterior chest wall it is best to have the patient sit with the arms folded or slightly bent forward and the arms hanging between the knees.

How to go about an examination: We use the following means: First, Inspection. Second, palpation; Third, mensuration; Fourth percussion. Fifth, anscultation; employing them as a means for our physical examination of the chest. In inspection note the form Some abnormal ones I have given you; size and movements also.

Movements: Note if there is a similarity of the two sides, if one side be restricted and the other increased. (Some Diseases).

If there is a depression in the infra-clavicular region it is a very good sign of tuberculosis. There is a condition sometimes present in infantile scurvy where the sternum and the cartilages of the ribs seem to drop in or backward. In palpitation it is beast to use a hand on each side of the chest wall and in this way compare the parts as you work. In this we may note any difference in the temperature of the parts. Any abnormalty noted by inspection may be confirmed by palpation. In mensuration it is only necessary to say it is best to measure just above the mipple or on a level of the sternal attachment of the 6th rib. Percussion is the act of striking. There are two methods employed, immediate and mediate. Immediate percussion is very little used. Mediate or indirect percussion. (Explain three ways). There is no exact standard of resonance nor the resistance or elasticity of parts. Hence both sides of the chest or any part of the body should be compared in the examination. The parts should be similarly placed and tensed in a slight degree. I told you how to place the patient to examine both anteriorly and posteriorly. Anteriorly, have the arms by the side unless you wish to get at the axilla. Then the arms must be raised. (Note the condition and time of breathing and force of the pleximeter hand.)

In auscultation the points in general which I have mentioned for percussion apply to the listening for sounds. Two methods employed. Immediate, as in placing the ear to the part. Mediate, when using a stethoscope, phonendoscope or some form of instrument. It is best to use the ear unless uncleanliness is such that it is necessary to use an instrument. It is necessary for you to make yourselves familiar with the normal sounds, both in auscultation and percussion, then when making examinations you are able to recognize the abnormal. (Instruments.)

Along the same line it seems to be well for me to make mention of the different regions of the chest wall. You may get this from any compend of practice or from your Gould's dictionary; also texts on physical examination of the chest wall. (Explain lines drawn.) The three primary divisions are anterior, lateral and posterior.

Anteriorly: First, supra-clavicular about one inch in extent just above the clavicle.

Second, clavicular, the inner two thirds of the clavicle.

Third, infra-clavicular, from the clavicle to the lower border of the third rib.

Fourth, mammary, from the 3rd to the 6th rib.

Fifth, infra-mammary, just below the sixth rib.

Laterally: First, axillary region from the point under the arm to the lower border of the sixth rib.

Second, infra-axillary just below the sixth rib to the twelfth

Posteriorly: First, supra scapular, region above the scapula.

Second, scapular, the portion covered by scapula. (Give the extent.)

Third, interscapular, corresponds to the space from the 2nd to the 7th ribs, being between the scapula.

Fourth, infra-scapular, this extends from the lower angle of the scapula to the 12th rib.

The preceding points may not be of especial interest to you yet in examinations of patients and in your readings you may find use for them, hence the necessity of giving them. So many of these points mentioned in and around the scapula, we mention a few more. You may note that the inferior angle of the scapula is held down by the latissimus dorsi. A line drawn from the root of the spine of the scapula to the 12th dorsal vertebra gives the lower border of the trapezius. If the latissimus dorsi slips off the angle of the scapula there appears a marked projection. This causes some loss of power of the limbs as the scapula is not held to the thoracic wall. Many times such symptoms may be due to paralysis of the posterior thoracic nerve, the nerve of Bell. If this nerve is affected, it might lead to the affectation of other parts of the body. You remember this nerve is from the 5th and 6th and sometimes the 7th cervical. Hence it would be very likely connected with the phrenic and also the brachial plexus, so that a lesion here might lead to trouble in the phrenic or brachial plexus or the opposite condition, in which affectations from the above named sources would affect the posterior thoracic.

In our last lecture we spoke of a few points in connection with the clavicle. There are a few more we will mention to-day. Braune states that by pressing the clavicle against the first rib in the dead body a stream of injection in the thoracic duct can, in some cases, be entirely arrested." This seems to me to be of especial interest to osteopaths, although I have nerve seen or heard it made mention of. In the dead body, of course, this would have to be mechanical, as there would not be any nervous connections through which it could act, hence from pressure effects. You remember the location of the duct. (Give it) It is very easily seen how pressure could be brought to bear sufficiently to shut off the flow or partially so, not alone in the dead body but in the living, especially if the position of the duct be slightly changed. Might we not find here some explanation of the long, lank, lean look of some people who seem to eat enough, and the digestive process in fairly good condition? (Explain the extent of such closure partial.) If the lymphatics are supplied with nerves from the sympathetic system and the thoracic duct from the cervical sympathetic, the pressure of the clavicle on the nerves could affect the duct. It is not surely known of such innervation, although Howells states that in the dog some fibers from the splanchnic supply the receptaculum chyli.

We have seen how to raise a clavicle, now it is necessary for us to know how to fix it when displaced. These displacements may take place either at the acromial or sternal end. Downward at

the acromial end is the most common. Relax the ligaments and muscles by placing the arm to the side, pushing it upward and inward, with the other hand get against the anterior edge of the clavicle toward the acromion. Exert pressure upward while traction is given by raising and rotaiting the arm outward to draw it into place. If this end is upward there may be pain from catching some fibers of the deltiod. In this case the arm would have to be raised to relax the structures, get your fingers in behind the part slipped up, then use traction there while drawing and rotating the arm downward and inward.

The clavicle may be slipped at the sternal end. There may be three ways. (Explain them.) In allnthese forms we are able to relax the tissues by the arm against the side and then pushing upward and inward. According to the manner it is slipped catch hold of the clavicle and exert traction toward the normal position, while drawing with the muscles and ligaments, by pulling outward and upward with the arm of the patient..

The different forms of the chest wall concerns us today as to the theory of the results. If you find a chest abnormal in shape from Pott's disease, rickets, emphysema or paralysis there are sure to be effects on both the nervous system and the blood vessels. In most of these cases there is a posterior curvature existent as well as the misshapen ribs. From the ribs we generally get an irritation to the terminals of the dorsal region and this affects a center or centers in the cord. (Our theory, and used by Hilton.) Again the thickening of the covering of the cord may directly from pressure effects produce serious results on the cord centers and carry impulses to the periphery. There is likely to be an impingement on the nerves as they leave the spinal canal, these being such as shut off nervous impulses entirely and cause paralysis, or to continue as a source of irritation to the nerves. In Potts' disease, so Osler says, the pressure symptoms are from the inflamatory condition of the cord, which causes a thickening of the dura and the deposit between the dura and the canal wall. Now note the result. The irritation is primarily to cerebro-spinal life.

You remember me showing you how a recurrent branch from the cerebro spinal nerves was sent to the canal, supplying vertebrae, ligaments and dura mater, this was also accompanied by a branch from a sympathetic ganglion. This is distributed similarly and to the blood vessels. Hence from the close connection with the sympathetic we see the effects that may be obtained on visceral life and an effect obtained over the blood vessels of the different areas. (Explain). In treating such cases we generally bring traction on the vertebrae by a straight pull. This acts in a similar manner, that is, the blood is given free ingress to the diseased parts, they are built up, the irritation to cerebro spinal life is lessened and a normal condition of the sympathetics is restored.

A word might be said in regard to pressure symptoms on the great vessels behind the manubrium, especially when the clavicle and first rib are not normal. But it seems you are able to note them yourselves. The numerous nervous connections here, especially with the region of the head and neck and viscera in the thorax are likely to suffer. (phrenic, vagi sympathetic.)

LECTURE 31.

TREATMENT OF RIBS, ETC.

12 Effect of different positions of the ribs: If the first, second and third ribs are up there is likely to be trouble with the bronchials or heart. The clavicle being down will also help. In this region is sometimes found the lesion causing hay fever. It must be remembered that these are not the only causes of such condition. There may be many complications and these not be the primary causes. A cause of these troubles following the misplacement of these ribs is easily explained. The impingement on the cerebro spinal nerves is the first thing. Impingement on the sympathetics or irritation by means of the branch from the thoracic ganglion or the effects on the sympathetics at and near the annulus vieussens. There may also be some interference or impingement on the phrenic and vagi nerves. This may partially explain why misplacement of the 6th, 7th or maybe the 8th ribs may cause asthma, while the 5th rib may cause an interference with breathing and the upper ribs a congested condition of the lungs.

Some effects obtained by treating at or between certain ribs. You may relax the pylorus by treating near the spine between the 4th,5th and 6th ribs; it is supposed that we get the effect through the vagus. The cardiac orifice is just back of the 7th rib cartilage. We may treat under the 9th rib on the right side to reach the gall bladder, which may be of material benefit if the patient has gall stones. On the left side the 9th rib would reach the upper border of the spleen. It is saidthat misplacement of the 9th rib may cause gas on the stomach. I know of no explanation.

By treating near the spine at the 11th and 12th ribs is one good point in treating in cases of flux. I will give an explanation of this when speaking of the intestines.

How to raise and lower the ribs: To-day we will notice some ways in which the ribs may be raised. We may separate the clavicle and first rib by putting the thumb between the rib and clavicle, then draw the arm down, up over the chest and face rather drawing it backward. The first and second ribs are the most difficult as they are attached to the scaleni mucles. Use these muscles to help you. Have the patient on a stool, push the head to one side, so, then place the fingers well down on the first rib, back of the clavicle; rotate the head to the opposite side, while pressing down with the hand back of the clavicle. When you have a patient sitting on a stool or bed, reach around the patient with one hand, placing it on the angles of the ribs, with the other, push the shoulder back and down. This relaxes contractures and is a good treatment in pneumonia. You may put the thumb in the back near the angles, or between rib articulations and then raise and rotate the arm with the other hand. The isea is to get a lifting power by using the pectoral muscles in front and some help from the latissimus dorsi behind. We may cushion the knee in the back, grasp both arms and rotate them up and over. Again, while the knee is in the back, we may reach around the patient and exert pressure on the cartilages with both hands. This is similar to a move I gave you for replacing a vertebrae when anterior: Knee on the anglesof the ribs, reach over with one hand and exert pressure on the ribs and its cartilages, while with the other hand you raise and rotate the arm.

We may now put the patient on the table, their elbow against

you, your fingers on the angles of the ribs. Or you may put the finger of noe hand on the angles of the ribs, their elbow to fit in the bend of your elbow and exert raising pressure while you have the other hand on the ribs and cartilages in front. It is well to have then take a full breath while you do this, trying to get the rib to the proper place, then holding it there while they exhale, or giving it any twist or turn. You may exaggerate the condition found. Have the patient take a full breath, then spring the rib to its proper place when they exhale. patient on saide, get behind them and put knee in back on angles of ribs; reach over on chest wall with one hand, raise and rotate the arm with the other hand. Where they are overlapped and twisted it is well to get an assistant to raise and rotate the arm. Have the patient on the side, while you use one hand on the angles, the other on the cartilages. For the cartilages you may put one hand on the cartilages, bring the arm up to the level of the shoulder and push backward. While doing this with the fingers you may make any twist or raise the cartilages or lower them. You may give what Dr. C. Still calls a quarter turn. Draw up the legs to right angles, place the fingers of one hand on the ribs you wish to manipulate, on the legs push them downward, upward and backward. If ribs up, lower ones, as we may find the 11th etc., get the thumb under the free edge, the fingers on the angles, the legs are drawn up, then pull them down.

If lower ribs are down stretch the quadratus lumborum; put the patient on the back, reach under and catch the angles of the ribs while you raise the cartilages in front, this generally for the lower ribs. The 11th and 12th ribs are raised or pulled out in this way. You may raise them as we stretch the rhomboidei. You may place the patient on the stomach, use the palm of the hand on the angles, with the other raise the arm.

Treatment of the mammary glands: All of you understand the blood supply of these glands. If the ribs are twisted, the upper six, or the cartilages thrown together, there is likely to be trouble with the gland. Hence the first thing is to remove any cause of irritation by releasing contracture or by straitening any rib out of order. There is an intimate connection between the uterus and the mammary gland, yet physiologists tell us that the connection is more by means of the blood supply than by means of the nerve system. This connection can very readily be established by means of the internal mammary and the external illiac. It seems to me there must be more than such a connection, I mean a nervous one. Note the following: Many times there is a soreness and hardening of the breasts during the menstrual period. Again, that frequently the nursing of the child may be a day or more after parturition brings on after pains. These are uterine contractions and Lusk states they are reflex contractions from the suckling of the infant, hence this would seem to show a nervous connection between the two organs. We may theorize a little, there could be a nervous connection by means of the vaso motors. This would control the blood supply. Now note the two following statements: First, the constant growth of the ovarian cells and the consequent swelling of the ovary subjects the ovarian nerve fibers and through then the spinal cord, to a constant slight stimulation(American Text Book of Physiology) and many times this shows effects on the

mammary gland. Second, the statement from Lusk's Midwifery, and the consequent effects on the uterus.

23 May there not be a nervous path, as follows: The intercostal nerves anterior and lateral cutaneous of the mammary region is the nerve supply. An irritation here generates impulses which affect the sympathetic ganglia in this region. This is in the manner I explained to you recently. The impulse is carried to the solar plexus. There the nerve fibers which supply the uterus are from hypogastric plexus and the third and fourth sacral. The hypogastric plexus is from the semilunar ganglia of the solar plexus, hence the path for the impulse from the solar plexus to uterus. If the impulse travels one way may it not the other and congestion of the uterus thus affect the mammary glands. If such a theory be true it is not very hard for us to understand the statement which Dr. Bollis makes when he says he rubs the nipple to discharge offending matter from the uterus. Also it serves as explanatory of the condition found in the organ when there is a morbid condition in the other, causing an excess of nervous impulses to be generated. (disseminated Impulses.)

THE HEART: Outline on the chest wall: The base is nearly opposite the 6th, 7th and 8th dorsal vertebrae. The highest part of the base corresponds to a transverse line at the upper border of the third costal cartilages, half an inch to the right and an inch to the left of the sternum. The apex, fifth interspace, about the junction of the ribs and cartilages, that is, two inches below and an inch internal from the nipple. The lower and right border is shown by drawing a line from the apex across the lower part of the sternum (above ensiform cartilage) then curved outward to base line. The left border is outlined by drawing a curved line from base to apex so as not to include the nipple. A circle two inches in diameter, drawn from a point midway between the nipple and the end of gladiolus, marks most of the dull sounding space of the heart not covered by lung or pleura. A needle passed through the second intercostal space close to the right side of the sternum, would passthrough the lung, pericardium and then the most prominent part of the bulge of the aorta. A needle through the first intercostal space, close of right of sternum will pass through the lung and then enter the superior vena cava.

Ordinarily the apex of the heart pulsates between the 5th and 6th ribs. (Note location). The position of the body varies the point of the apex beat, also inspiration and expiration. Again the heart may be hypertrophied, or some other contiguous organ be enlarged and consequently force the heart from its normal position, there being cases where the heart has been found on the right side.

LECTURE 32 - 1

THE HEART - Continued.

Position of Valves: The aortic valves are behind the third intercostal space close to the left side of the sternum. The pulmonary valves are in the front part of the aortic, just behind the junction of the third costal cartilage with the sternum. The tricuspid valves lie behind the middle of the sternum about the level of the fourth costal cartilage. The mitral valves are the deepest of all and lie behind the third intercostal space about one inch to the left of the sternum. All of these valves are covered by a thin layer of lung; hence we may hear their action better when the breathing is suspended for a moment.

The valves are so close together that it is necessary to go out a little way in the direction of the valve if we wish to discriminate the sound of one from theother, hence to auscult them separately, we go out a little way on the course of the diverging blood currents. We may listen best to the aortic sounds over the second intercostal space at the right border of the sternum. Posteriorly listen from the third to the ninth dorsal spines over the aorta, it is heard plainly. If any murmur it is easily distinguished.

Auscult the pulmonary valve over the second interspace at the left border of the sternum. The tricuspid valve over the middle of the sternum above the ensiform cartilage. To listen to the mitral valve best over the apex of the heart.

The first thing in an examination of the heart is to note the pulse. You know where to find it, the radial artery at the wrist. The pulse examination tells you the force, frequency and regularity of the heart beat. Next you would want to inspect the chest wall to note the shape of the chest. (Young man, enlarged cardiac region, cigarette and bicycle) We must also note the position, force and regularity by inspection and confirm by palpation. By percussion you can get the exact location of the dull sounding region of the heart and, as mentioned in our last lecture, if any of the viscera are enlarged and have encroached on the heart we are able to detect it. Hence it becomes very necessary to note the exact condition of surrounding organs.

Auscultation is our principal reliance in the examination of the heart. We note the sounds of the different valves of the heart at the points mentioned previously in the lecture. You must learn to differentiate the sounds heard when examining the heart. It is hardly within the province of these lectures to take up an explanation of any of these points: In ausculation you may use either the ear or an instrument on the naked body, or covered with a thin cloth or garment, so that the sound may not be obscured.

24 Disease in different parts of the body may cause heart trouble many times. This is because of the close connection with sympathetic nerve life. Trouble in the neck, as some misplacement of the clavicle of which we have spoken, or the first or second ribs. In the first instance it is partially mechanical by means of pressure on the subclavian vessels. Also there is an effect to be obtained by the irritation to the nerves in this region, which we will explain later. Sometimes the same kind of a slip may cause the heart to miss a beat, to be irregular. This is explained by the periodic emptying of the innominate vein. In the second

condition the ribs are nearly always raised and in some way may interfere with the circulation. Again an interference with the nerves of a region will be the cause of the trouble. A case where the third and fourth rib was slipped and the heart would miss every seventh beat. (Mr.Fisher). Diseases of the genital organs sometimes affect the heart, while ~~dislocation~~ stretching of the rectal sphincter affects the heart and circulation and many times in this manner we are able to make the patient break out in a great sweat. Old Dr.Still sometimes says an injury may cause a relaxation of the vault of the diaphragm. This would cause a constriction of the aorta where it passes through the diaphragm and consequently restrict the blood flow. I remembered seeing the old Dr. wearing a belt and we found out it was for the purpose of compressing the lower part of the thorax and allowing the diaphragm to bulge upward.

Nervous Supply of the Heart and Connections: There are generally three places at which we treat to get effects on the heart, in the neck, the upper dorsal and the splanchnic area. These are not the only places that the heart may be affected, else in the disease of different viscera there would be no cardiac symptoms.

The nerve supply of the heart is from the vagus and the sympathetic. The inhibitory center for the heart has its seat in the medulla. These fibers are from the vagi and not from the spinal accessory as used to be thought. Most of these fibers for the heart are given off in the neck. Some from the recurrent laryngeal in thorax. The major part of the fibers join the sympathetic fibers as they pass to the heart. The vagi are connected with numerous viscera. One vagus often possesses more inhibitory power than another. The pneumogastric is also considered the trophic nerve of the heart.

The source of the fibers that oppose the vagi will now be considered. These fibers seem to be primarily of spinal origin. There are three cardiac nerves from the cervical sympathetic on each side of the body and Quain states that these are accelerator fibers and are derived from the second and third dorsal chiefly but may be from the upper four or five dorsal. (Explain C.Plexus) The first four or five thoracic ganglia of the sympathetic give off branches which form a plexus around the thoracic aorta. This plexus around the aorta gives fibers to the cardiac plexus of the heart. These thoracic ganglia of the sympathetic are directly connected with thecerebro spinal nerves of this region. This would give an explanation of an inframammary pain an heart trouble. In a previous lecture we had this explained.(Note it.) Again the great splanchnic is connected with these sympathetic ganglia as high up as the third thoracic or higher. This nerve passes to the different viscera. The connection given above to the heart and the aorta show us very rradily how diseases of viscera supplied by splanchnic nerves affect the heart. Wrisberg says there is a connection between the splanchnic and vagus nerves. The vagus nerve contains both afferent and efferent fibers of the heart, the efferent fibers doing the inhibitory duty while afferent are the depressor fibers. It is by means of these afferent fibers that we recognize cardiac events, such as a sense of compression of the heart. Some call these the centripetal fibers of the vagus. 25 Note this, stimulation of the pulmonary branches of the vagus, this cam

be done by forcing air into the lungs, as loud speaking, singing, etc., increases the heart beat. There is this point, if we stimulate the nerves in the neck, it will increase the heart beat. There may be two causes for this First, it may stimulate the vaso constrictor fibers, causing narrowing of many vessels, hence there is a rise in blood pressure and an increase in the heart beat. Second, there are fibers here in this region which pass to the heart having an anugmentory effect on the heart, hence the increase in the heart beat. While simultaneous stimulation of the augmentor and inhibitory nerves in warm blooded animals causes inhibition, although the vagus effect is diminished.

The stimulation of sensory nerves like the sciatic, better a mixed nerve, will cause inhibition of the heart if strongly stimulated. If weakly stimulated there will be an augmentory effect. A stimulation of the abdominal sympathetic causes the center in the medulla to be stimulated and a slowing of the heart beat.

Dilating the stomach inhibits the heart's action. This is produced by the sympathetics carrying the impulses to the inhibitoy heart center in the medulla and the vagus, slowing the heart. We see from the above why a contracture in the upper dorsal region or a misplacement of ribs or vertebrae is very likely to affect the heart's action. By spreading the ribs here the heart action can be quieted. while if there is any fever, in which the pulse shows a material increase, we may show it by getting pressure on the ausa subclavia. This will cause a direct inhibition to the augmentory or accelerator fibers. In previos lectures many points have been mentioned which may irritate or inhibit these nerves and we now know what the effect would be. In functional disorders of the heart we are very successful, while organic diseases may not be reached at all times.

There is a point which I wish you to notice, that is, that the aorta may be dilated or even the heart working forcibly and not showing itslef felt in the pulse, this satisfying us it is not general. I remember the first case of this kind I saw. (Mrs. Eddy of Kirksville.) I was sure there was an abdominal aneurism. It seemed that at the lower edge of the stomach there was a great thumping and the pulse showed no appreciable increase. Such cases are explained by saying the centers in this part of the aorta are stimulated by some irritation or it may be dependent upon the condition of the system generally. Hence in any heart trouble we would look well to the upper dorsal region, then the neck. In this last named place is where we must note if any difficulty to the great vessels or nerve paths. The next point is to examine the splanchnic area (Vagi and sympathetic) and by the varied nervous connections we are able to establish a correct diagnosis.

LECTURE 33 - 1

THE LUNGS.

Outline: The lungs are continually expanding and contracting yet we will outline them with as much precision as the breathing permits. (Holden). The apex of the lung rises into the neck about an inch and a half. This is behind the sterno-mastoid muscle and nearer the posterior than the anterior border of the muscle.

It is rather higher in females than in males. From the sternal end of the clavicle the lungs converge so they almost meet in the middle line on a level with the second costal cartilage. Or a line drawn from the apex of the lung to the junction of the manubrium and gladiolus. Thus we see there is little or no lung behind the first piece of the sternum. From the level of the second costal cartilage to the level of thefourth the thin margins of the lung run parallel, close behind the middle of the sternum. Hence their thin edges overlap the great vessels and valves at the base of the heart.

Below the level of the fourth costal cartilage the lungs diverge, but not similarly. The right passes downward and corresponds in direction with the cartilage of the sixth rib. The margin of the left lung is notched for the heart. It follows outward on the cartilageof the fourth rib and then a curved line from this point to the apex of the heart. The lower border of the lung corresponds to a convex line drawn from the middle of the sixth chondro-sternal articulation in front to the 10th dorsal spine posteriorly. Now note the extent of the lung. In the mammary line it would be about the lowest part of the 6th rib. Laterally that is in the axillary line. The margin of the lung comes down as low as the 8th rib, while Treves makes mention of the 9th. Posteriorly a line dropped from the inferior angle of the scapula, would strike as low as the 10th rib for the lower margin of the lung.

Note this point: In deep inspiration the lung margins may descend as much as an inch and a half; also that in children the lungs are separated in front of the thymus gland. This gland disappears about puberty and the lungs approach each other.

The lungs are invested with the pleura which is reflected over the chest wall. The pleura extends lower than the lungs. In front it reaches about the level of the seventh chondro-sternal union. Behind the 11th dorsal spine it is in relation with the 11th rib posteriorly and may reach as low as the 12th.

Examination: In an examination of the lungs we make use of the same divisions that I gave you in a previous lecture, mapping out the chest wall. I am only giving you a few of the principal points and the others you must work out in studying the different diseases of the lungs. Our principal work will be in getting some of the osteopathic points in relation to the lungs and the theory of our work. The chief methods which we use in examining the lungs are by percussion and auscultation. Percussion is performed similarly to the way spoken of in examining the heart. The sounds elicited on percussing a healthy chest are not alike in all cases. The portion of the lung above the clavicle yields a tympanic note when near the trachea. Over the clavicle it is clear except toward the scapular extremity it is duller. Over the upper part of the sternum we get a slightly tympanic note, but below the 3rd rib it is dull owing to the presence of the heart and liver. Higher sounds may be produced by a thickening of the tubes or a

solidification about the tubes. If from a hemorrhage we have a collection of blood, or of serum from pleurisy, or accumulations of pus. These will interfere with the teansmission of sound and make it dull. In auscultation I wish to make mention of but a couple of points. The normal vesicular breathing or murmur is best heard on the anterior part of the chest. Bronchial or blowing breathing, so called because the air moves in a column, is best heard between the shoulders from the seventh cervical to the fourth dorsal vertebrae, if heard in other parts it is considered a sign of disease.

In ausculting the vesicular portion of the lung one of the most important points in physical diagnosis or examinations is to remember that inspiration is longer than expiration and that in health the expiratory sound may be entirely absent. Hence any marked increase in the depth and loudness of the expiratory sound so that it equals or exceeds inspiratory sound is indicative of disease, denoting a loss of elasticity of the lung. Beginning tuberculosis, pneumonia, etc.

There may be a flattening or posterior tendency of the spine in the dorsal region and this is a fruitful source of lung troubles as we will see when getting the nervous connections. Again in the dorsal region the ribs may be dropped down or there may be contractures drawing them together and producing a result similar to curvatures. Along the upper dorsal region we generally find the

difficulties in congestion, also that in cases of bronchitis the first three ribs may be causing irritation to the nerves. While in asthma the trouble may be anywhere from the third to the seventh and may be as low as the twelfth rib.

One point we missed, that there is only one diaphragm separating the lowest part of the pleura from the kidney, hence a trocar is never used to tap the chest in this region for fear of passing it into the abdomen.

26 Nerves and nervous connections: The nerves of the lungs are derived from the sympathetic pneumogastric and upper dorsal nerves. There are two sets of fibers or pulmonary branches distributed from the vagus to the lungs. They reach the root of the lung, one on the fore part and one on its posterior aspect. They enter into the formation of the anterior and posterior pulmonary plexus. The pneumogastrics are found to contain the following nerve supply for the lungs. Ist. Afferent and efferent broncho-contrictor and broncho-dilator fibers. 2nd. Afferent inspiratory and expiratory fibers. Third, afferent pressor fibers. (Efferent in sympathetic.) Fourth, general sensory fibers. Fifth, trophic fibers. Sixth, likely sensory fibers for the mucous glands. The spinal nerves that connect with the lungs are from the second to the seventh dorsal, the anterior roots. This is the origin from the cord of the efferent vaso motor fibers. These spinal nerves are continued in the sympathetic. We now note the course and connection of the sympathetic fibers. The second, third and fourth thoracic ganglia of the sympathetic send fibers to the posterior pulmonary plexus. Both the superficial and deep cardiac plexus of the sympathetic connect with the anterior pulmonary plexus, hence we have a connection in this manner with the first four or five sympathetic dorsal ganglia. (Explain anterior and posterior pulmonary plexuses).

Hence the vaso motors starting from the cord between the second and the seventh dorsal nerves pass generally from the sympathetic dorsal ganglia mostly through the first thoracic ganglion to the plexus es mentioned above and are then with the other nerves sid distributed along the bronchial tubes and their ramifications on which they are lost.

From the above it can be noted very readily why we treat in the neck and the upper dorsal region. In the neck we are able to affect the pneumogastrics while in the upper dorsal region we get an effect on thæ vaso motors or sympathetics. The fact of this nervous connection and some troubles like crying and hysterical hilarity are treated in this region has led osteopaths to say there is a center for such work along the spine from third to 5th rib inclusive. Also that contracture in this region is prone to cause such troubles. I wish to ask you to note in your experience as an operator if it is not true that such lesions are on the left side when the trouble is crying. All the upper part of the spine must be watched in lung trouble. The ribs must be examined at the same time. The position of the clavicle must be noted in order to keep it from causing impingement on the phrenic, vagi and sympathetic nerves, while the great vessels must not be impinged. The third fourth and fifth cervical must be noted as these are sure to cause irritation to the cervical sympathetic ganglia and in this way cause trouble to efferent vaso motor fibers of the lungs. The scaleni muscles may be found contracted and help to cause trouble with the phrenic and the vagus nerves. As we saw that the vagus supplied both constrictor and dilator motor fibers of the bronchials and their ramifications, we readily see how such an irritation might result in a change of the caliber of these tubes, any constriction tending to cause asthma. In asthma also, there may be a rather chronic inflamatory condition of the bronchials, If so, it is necessary to reach the blood supply through the sympathetic. Irritation of the superior laryngeal may cause bronchial pneumonia. In summing up the treatments for the lungs we would say, in congestion, treat the upper dorsal region. You can do this by putting the patient on the side and releasing all contractures. Then if the patient is in bed we may raise the ribs by getting an assistant to draw the arm up, around backward and downward. Raise the upper ribs by having the patient sit, put the fingers of one hand on the angles of the ribs and with the other push the shoulder downward and backward. Also put the thumb between the rib articulations posteriorly and rotate the arm. It is unnecessary to give any more of these moves as they are similar to the ones given for raising, lowering or twisting a rib. All of you are familiar with the fact that in treating bronchitis we pay strict attention to the three upper ribs. The flattening of the chest or posterior curvature must be overcome. Lastly we must treat the cervical ganglia of the sympathetic, which we may do by direct pressure, by removing contractures and also by posterior neck treating, getting an effect through the communicating branches which pass to these ganglia.(Clavicle in position also.)

LECTURE 34 - 1

PHRENICS AND SPLANCHNICS.

27 We have completed the region of the head and neck, have considered the thorax and its contained viscera. Most of the nervous connections were given and their benefit to us in our practice. It seems fitting before going to the consideration of the abdomen and contents that we have a word to say on the following nerves, the phrenics and the splanchnics. Each of these nerves are contained in the thorax, the first mentioned having its origin above the thorax, passing through and ending in the abdomen. The second one has its origin in the thorax and passes out to end in the different plexuses of the abdomen and pelvis. First we will speak of the phrenic nerves. This nerve arises from the 4th cervical with branches from the 3rd and 5th. Most of the fibers are from the 4th cervical. It passes inward over the anterior scalenus At the root of the neck it is placed between the subclavian artery and vein and passes over the internal mammary artery. It then passes nearly vertically through the thorax in front of the root of the lung and along the side of the pericardium. Near the diaphragm the nerve branches, these branches pass separately through the muscle and are distributed on the under surface of the muscle. We will now notice its distribution and some of its nervous connections.

Distribution: As the nerve passes through the diaphragm it forms, with fibers of the sympathetic form the solar plexus, the diaphragmatic or phrenic ganglion. This is the nerve on the right as the one on the left passes to it distribution without the intervention of a ganglion. While passing to the thorax it gives fibers to the pleura and the pericardium. The right one gives branches to the inferior vena cava and the right auricle of the heart. We gave its special spinal function. After passing to the diaphragm it gives fibers to the vena cava the suprarenal capsule and hepatic plexus. On the right side this is by way of the phrenic ganglion, after getting sympathetic fibers from the solar plexus. On the left side there is no ganglion but a junction of the sympathetic with the phrenic near the oesophageal and aortic openings of the diaphragm.

Connections: In the neck many times there is a branch from the second and third cervical nerves by way of the communicans cervicis or sometimes called communicans noni. When nearing the chest there is a branch of communication from the middle or inferior cervical ganglion of the sympathetic. In the chest it may and very likely does connect with the sympathetics. In the abdomen it connects with the solar plexus. Quain in a foot note says that there is likely a connection or branch from the three lower intercostal nerves to the phrenic plexus. This might be for the purpose of association of the muscles of respiration, as then the intercostals, diaphragm and abdominal muscles of respiration might be made to work more nicely in unison.

We must note that Luschka states the phrenic gives fibers to the peritoneum. This nerve at its origin is in direct connection with the brachial plexus and the branches from the second and third cervical to the cervical plexus. Hence note the parts of the body that we may affect by work on the phrenic. Sympathetic nerve life to some of the viscera, also to the spine by means of its origin and connection with spinal nerves. Thus it makes another pathway by which we may affect these parts of the body.

Especially the pericardium pleura, inferior vena cava and even the right auricle of the heart. The phrenic nerve sends branches to the porta of the liver.

Hilton says it is well to note the percision of nerve supply to muscles, that is, a muscle not only receives a definite nerve supply but receives it in a definite way, as a general rule so as to guard nerve from pressure. Instance, the phrenic nerve. (Explain) While another says it is very likely the nerve passes below so as to bring it into direct communication with the visceral nerves of the abdomen.

We know this, if the viscera or organs and vessels of which we have spoken, are diseased that generally symptoms are present showing that the phrenic nerve is affected. Also from spinal or cerebral troubles we may have phrenic symptoms. Now it is possible for the phrenic to be affected by diseased or abnormal conditions of viscera. May not we affect these viscera or different parts of the system by work on the phrenic. Such is surely true and the importance of this nerve begins to be made apparent to us. It is through this nerve we may tone up the muscles of respiration. It is by means of this nerve we generally hope to control the paroxysms of hiccoughs, in which there are spasmodic contractions of the diaphragm and closure of the glottis. The closure of the glottis is by the inf. laryngeal nerve. The afferent pathway is generally considered to be the gastric branches of the vagi. It may be from gastric irritation, alcohol drinking or uraemia. There is one way of which we might note as to how other persons have taken advamtage of phrenic control to allay this troublesome movement. One author said he placed the patient on a table on the back so that the head and upper part of the body hung over. Then by the force of gravity the abdominal viscera were brought to bear on the under side of the diaphragm and in this way inhibit the phrenic plexus. And as this emphasizes one of our theories that work on the terminals of nerves affects the nerves and the centers from which they spring. (Pain and belladona plasters.) Hence we see the value of work on nerve terminals to Osteopaths.

In our work on hiccoughs it is well for us to stop the irritation or, at least, to try to allay it and then to bring our work to bear on the phrenic nerve. We may get the phrenic nerve at its origin. (Show how). Also near where it enters the chest and this is near the fonticulus gutteris. We may get effects on the phrenic through its many connections. It is well to look to the position of the first rib and clavicle. In the treatment of asthma it is well to note the condition of the nerve because it is possible to allay the paroxysms by inhibition of this nerve. In respiration this nerve is very improtant. If one nerve is paralyzed the corresponding side of the diaphragm ceases to work. If both are paralyzed it will cause death in a few hours, unless the other inspiratory muscles are able to carry on the work. But we can see the relaxed condition of the diaphragm permits it being drawn into the thoracic cavity at each inspiration and thus hindering the expansion of the chest. I do not know if it has been worth the while to spend so much time on the nerve but it seems to me to be best to note its importance to us. The liability of its being affected by the extension of disease to it from other sources, and thus affecting its distribution, Or again, of disease beginning in its fibers and having such far reaching results on some of the vital processes.

Lecture 34 - 3

THE SPLANCHNICS.

By splanchnics is meant the nerves to the viscera. These nerves have their origin in the thorax. Taking them as a set of nerves they are one of the most important in the body. There mught be two reason given: First, the great extent of their distribution. Second, the control of visceral life by means of this distribution. We will first enter into a short description of these nerves. You have gone over these nerves in your course of study but we will give this more for a review, and to make you sure of the numerous connections and an idea of their importance in our osteopathic work.

These nerves have as their origin the thoracic sympathetic lateral chain of ganglia. We generally speak of three splanchnic nerves, though Quain says that Wisburg occasionally found a fourth. This one was called by him nervous splanchnicus supremus. It is given as formed by offsets from the cardiac nerves, from the lower cervical as well as fsome of the upper thoracic ganglia. The remaining three splanchnics are distinguished as the great, the small and the smallest(abdominal splanchnics of Gaskell.)The great splanchnic is formed by roots from the 5th or 6th to the 9th or 10th thoracic ganglia. This nerve passes downward over the bodies of the vertebrae, passes through the crus of the diaphragm. It terminates in the upper part of the semi-lunar ganglion, although some of the fibers may end in the renal plexus and the suprarenal body. Many of the fibers in these nerves are continued directly from the spinal nerves. Hence this nerve is composed mainly of large white nerve fibers (4 / 5 so says one author), hence some of these fibers must be what we found in our lecture on the sympatheti nerve, to be called the "rami efferentes." This is strengthened by the fact that these fibers pass to one of the great pervertebral plexuses. And such, we said, was the destination of the rami efferentes. This nerve is sometimes said to divide and form a plexus with the small splanchnic. This takes place in the chest. It also gives filaments to the front of the vertebrae and to the aorta. This nerve may be traced as high as the third thoracic ganglion and is said generally to be connected with all the upper dorsal ganglia.

The small splanchnic nerve gets its origin from the 9th and 10th and may be the 10th and 11th dorsal ganglia of the sympathetic Quain states that it may be from the neighboring parts of the cord. This nerve passes through the diaphragm either in company with the great splanchnic or through an opening for itself. It ends in the lower aprt of the same ganglia as the preceeding, the semi-lunar. It may also end in the aortic renal ganglion. As stated, this nerve sometimes connects with the great splanchnic in the chest and may also furnish branches to the renal plexus, this is true if the next splanchnic is very small or wanting. The smallest splanchnic (nervus renalis posterior) is from the last ganglion of the sympathetic in the dorsal region and passes through the diaphragm in company with the sympathetic cord and ends in the renal plexus. Its name gives its destination. In our lecture on the sympathetic we make mention of the part of the cord which furnishes the white rami communicantes. (1st. D. to 2rd and 4th L.) These by their connection with the sympathetic are called splanchnics.

This division is made by Gaskell, and to follow him further he says that branches from the second, third, and fourth sacral nerves, correspond to the white rami communicatntes. They do not join the sympathetic cord but pass directly to the prevertebral plexus. As these are visceral branches he calls them the pelvic splanchnics. In the same group are included visceral branches from a number of cranial nerves (cervico-cranial rami viscerales) This group includes pranches from the pneumogastric, glosso-pharyngeal, facial and third nerves. Hence as a summary we have three sets of splanchnic nerves. First, the cranio-cervical, second, the thoracic or abdominal splanchnics, as described in the beginning. Third, the plevic splanchnics. And we have contained in these nerves medullated fibers classified as follows: First, sensory fibers. Second, Vaso-viscero-constrictor fibers all ending in ganglia of the sympathetic. Third, vaso dilators and viscero-inhibitory nerves and these are continued as medullated fibers to their destination. There may be no special trophic fibers and yet as we saw in our last lecture they exert a trophic influence over certain organs. (Lungs).

Byron Robinson calls those nerves we mentioned as having their origin in the upper part of the body and those spoken of below the fourth lumbar as peripheral and supplying the parietes of the body. The fibers named are of the gray nonmedullated variety. Then taking the abdominal brain and its nervous connections, we have the following summary according to his idea; (a) presides over nutrition, (b) controls circulation, (c) controls gland secretion, (d) presides over organs of generation. Now as the splanchnics are the principal nerves of this solar plexus, we may note the effect on the body of these nerves. It presides over nutrition somewhat similarly to the way the fifth nerve controls the nutrition of the eye.

In controlling the circulation, the splanchnics contain the vaso-motor fibers to the abdominal blood vessels, and the afferent fibers from the abdominal viscera. The first point has had sufficient proof in the statements, that by stimulation of the splanchnics there was a constriction of the arterioles of a great area and was very likely to exercise an influence on the action of the heart in that the heart has greater peripheral resistance to overcome. Another point from Landoe & Sterling is the fact that a person may bleed to death in their own belly. This is brought about by a stimulation of the vaso-dilator fibers of the splanchnic area or an inhibition of the vaso-constrictor impulses..

Then it is known that a connection exists between the cutaneous and the deep vessels of the body, in that the cutaneous vessels are dilated when constriction of the deeper vessels takes place. This is called an inverse relation and does not always exist. The fibers to the kidneys, vaso motor, are contained in the splanchnics hence we readily see how stimulation of the splanchnic area would affect the secretion of urine, and, if irritated, lead to an abnormal condition of these organs and the whole body. Then as to the point that the splanchnics contain afferent fibers, you remember the effect of sudden stimulation of the solar plexus. These same Afferent fibers carry the impulse so generated, and stimulate the inhibitory center of the heart so that we have a stoppage of its beat.

Again that these afferent fibers are from the different visera which the splanchnic nerve supplies, is shown by the effects produced, when we have diseases of some abdominal or pelvic viscus, on the heart or lungs (the vital processes of the body). There may be two reasons for this. First, because of the influence these afferent fibers convey to the brain and arrect the cardiac or respiratory center there. Second, because of the close connection between the splanchnic nerves and the nerves from the upper thoracic ganglia to the heart, lungs and the aorta. This we reviewed in a previous lecture. (Call for it.) Hence you see our work on the splanchnics may be in the nature of a regulation process In that we can influence the blood supply to the abdominal region and relieve congestion in other parts, thus bringing about an equalization of the circulation. These afferent fibers are also a help to us in diagnosing and treatment, in this way: A viscus is diseased, this causes an irritation to these nerves and the impulse is carried so as to affect a center in the cord. This is shown then by contractures along the spinal cord muscles. And, as we can affect centers by working on the peripheral terminations of nerves by our method of treatment we are able to affect the viscus in question and remove morbid conditions. The splanchnics also contain viscero-inhibitory fibers for the stomach and intestines. This will be noticed when speaking of the intestines. (Explain effect produced on heart). That by working in the splanchnic area we may release contractures and bring about a dilation of the splanchnic area. This will lessen the tension and quiet the irritation and bring about a slowing of the blood stream. Hence the effect we get on viscera connected with the splanchnics both directly and indirectly. The effect of the splanchnics on the organs of generation will be given when speaking of those viscera.

The sympathetics have control of nutrition and rhythm and a continuous irritation soon disarranges a center and the rhythm of the organ is changed or destroyed. By rhythm we mean the repetition or occurrence of certain events in continuous cycles. This might be said to be brought about by the continuous explosion of nervous impulses from the governing centers. In the case of the heart little more than once every second, respiration once in about every three or four seconds, while in the uterus only once every lunar month. Hence the result, disturbance of rhythm, consequent on a continuous irritation. The disarranged center does not now discharge its energy at the appointed time and we note the heart missing a beat, slowed or hastened in its action. Likewise the uterus from irritation to its mucous membrane looses its rhythm and may cause amenorrhea or menorrhagia.

This loss of vaso motor control causes a deficiency of tone in any organ of the body, that is, any of the circulatory apparatus or viscera. Byron Robinson says the difference between the action of the two systems is as follows. From the cranial brain, it is active direct and reflex subsiding after action. While from the abdominal brain (solor plexus) it is rhythmetical, cycle after cycle, yet they are not independent from the other.

Landmarks of the Abdomen: We might call to mind the divisions on the abdominal wall. This is generally spoken of as containing nine regions. These of course are artificial and are given only for the help of description. There are two circular lines, the

upper one is parallel with the cartilages of the 9th ribs, some authors say the 10th. The second line is level with the highest part of the chrest of the ilium. There are then two lines drawn from the cartilages of the 8th ribs to the middle of Pouparts' ligament. This would give us nine regions named as follows: right and left hypochondriac, between them the epigastric. Below these the right and left lumbar, between them the umbilical. Below these the right and left inguinal and between them the hypogastric. This is naming them from above downward.

We will now take up the lines on the abdomen. The first is the linea alba (white line) the central line of the abdomen, this is the union of the aponeuroses of the abdominal muscles. It runs from the apex of the ensfform cartilage to the symphysis pubis. This is the thinnest and least vascular part of the abdominal wall. The linea semilunaris is at the outer border of the rectus muscle and corresponds to a line drawn from the lowest part of the 7th rib to the spine of the pubes. Tehse lines curve outward from the two attachments. Other lines which are called linea transversae are tendinous intersections across the rectus abdominis. There is seldom any of these lines below the Umbilicus. There is generally three of these lines, one at the umbilicus, one about opposite the ziphoid cartilage and the third is between these two. Two of these lines are seen on the surface of well developed subjects, but artists generally exaggerate them. As a matter of importance to us in diagnosing it is necessary for us to be familiar with the shape and position of these lines. These lines mark it off into muscular squares. A spasmodic contraction of one of these divisions, or again collections of pus or serum may form enlargements and be mistaken for deep seated abdominal tumors.

The umbilicus is placed about on a level with the third lumbar vertebrae. The aorta divides a little below the fourth lumbar. Just below the umbilicus is a good place to apply pressure to the aorta, a little to the left of the median line. This is better than above as there important structures may be injured if much pressure is used. (Position of umbilicus at different ages).

The bony prominences are the ribs above and their cartilages. Below they are the anterior superior spine of the ilium, the spines of the pubes. The line of Ponpart's ligament is a landmark that should be thoroughly familiar to us. The umbilicus is or should be a point of fusion of all the tissues of the abdominal wall. But sometimes it is pervious and gives passage to the contents of the abdomen. It may be the seat of hernia,- more common in working women than men . There may be an escape here of ovrian pluids, pus as in peritoitis or entozoa. The umbilicus is always deeper and wider in women than in men. The umbilicus will bulge out considerably in ascites, the fluid gets in and stretches it. In tumors, this cannot be the case.

The promontory of the sacrum is a little lower than the crest of the ilium, the highest part of crest. The aorta bifurcates just above the promontory of the sacrum, hence the bifurcation of the aorta would be on about a level with the highest part of the crest of the ilium and a little to the left. This is sometimes given as one and one half inches below the unbilicus and a little to the left. A line drawn from this point with a slight curve outward, to the groin where you can feel the pulsation of the common femoral

artery, gives the direction of the common and external iliac arteries. This artery pulsates rather nearer to the pubes than the ilium. The first two inches is called the common iliac although this is a variable quantity.

Parts behind the linea alba: the first viscus is the liver beginning above at the ensiform cartilage. The left lobe of the liver extends two or three fingers breadth below the ensiform cartilage. Here is where the lobe crosses the middle line. Just below the edge of the liver comes the stomach. This is in contact with the lenea alba according to its degree of distension. There may be times when the stomach occupies all the space from the umbilicus to the liver. This would only be caused by great distension. Again if the stomach is empty it is retracted and is flat on the pancreas. This would be behind the liver and at the bach of the abdomen. This retraction causes a hollow on the anterior wall called the pit of the stomach. Just above the umbilicus lies the middle part of the transverse colon. This may be a distance of two or three inches according to the distension of the colon. The small intestines are behind and below the unbilicus and covered by the great omentum. The bladder when it is distended may rise half way up to the umbilicus. Generally the peritoneum is in contact with the linea alba, but where the bladder is greatly distended it raises the peritoneum upward from the pubes. This would make a space of about two inches above the pubic bones, where incisions in the abdominal wall could be made and no injury done to the peritoneum.

The bony prominences were mentioned,- some of their uses for measurements ought to be given. Ant, superior spines,-these may be used as points for measuring the length of the limbs. From these spines to the inner malleolus. A good plan in taking such measurments is to take a line or point in the middle of the body. The pubes can be used in this manner and the measurements taken to the inner malleolus. (Case of the leg shortening when legs are the same lenght). The spine of the pubes is a means of distinguishing between femoral and inguinal hernia. In an inguinal hernia the spine is on the outer side of the neck, while in femoral hernia the spine is on the inner side of the neck of the hernial sac. The spine of the pubes is nearly on a level with the upper part of the trochanter major. The femoral ring is about one inch external to the spine. This ring is the seat of the stricture in a femoral hernia.

A word about Ponport's ligaments It extends from the anterior superior spine of the ilium to the spine of the pubes. This ligament is indicated by a cresent like fold or furrow in the skin of the groin, as the convexity of this line is downward. The external abdominal ring is almost above the pubic spine. This gives passage to the round ligament in the female and the spermatic cord in the male.

The proper position to place a patient for an examination of the abdominal wall is as follows: Have the patient lie flat on the back, have the head and shoulders raised, as this will tend to relax the abdominal wall especially the rect; then flex the thighs on the abdominal wall, of course, only partially, this completes the relaxation. From your own experience very likely you recognize the fact that the tips of the fingers must not be used to dig around and cause the parts to contract.

LECTURE 36 - 1.

Examination of abdomen, continued: The last point in the preceding lecture was to be careful in treating the abdomen and not to use the points of the fingers and dig. This is doubly true in typhoid fever. By many of the old school physicians it is said no treatment should be given on the abdominal wall in this disease. The intestinal lesion is in Peyer's patches and they claim that work in this region is likely to cause additional irritation or lead to rupture. Such has not been our experience in this fever. Of course the work is done to try to produce a mechanical effect, then the prediction as to a perforation might be realized. our object in this fever should be to affect the peripheral terminations of the abdominal nerves.

There are some patients you will find in which the abdominal wall is very tense and the tips of the fingers only aggravate the condition. Again we see the necessity of using the flat of the hand at this time, in fact, at all times, as then we are in no danger of injuring the parts that are diseased, nor causing an increase in the tenderness of the muscles and thus obscuring the condition of the contained or deeper structures.

The position of the abdominal contents are variable. This can be attributed partly to the kind of cavity in which they are contained, also the positions which many of these organs take and the enlargement that seems possible to some of them in physiological limits. In the chest it is very much different, as they are contained in a cavity which does not change so very much because of its bony walls. The division or partition between the two cavities is the diaphragm, and its position may be somewhat different from what we might think. It s height varies constantly in respiration, also according to the degree of distension of the stomach and intestines and the size of the liver. In forced inspiration it would be represented by a line drawn from the ensiform cartilage toward the 10th rib. In forced expiration it rises from one to two inches, the right side is on a level in front with the fourth costal cartilage, and the 8th rib behind. This would put it nearly on a level with the nipple. This is higher than we would suspect, yet in pregnancy the pressure upward of the viscera is sometimes very marked in its effects on the heart and lungs. The left arch is from one to two ribs' breadth below the level of the right one. (Case of pregnancy causing heart symptoms.)

In our examination of the abdomen we use the same methods, spoken of in examination of the contents of the thorax, viz; inspection, palpatation, mensuration, percussion and auscultation. There is one other method sometimes used in examination of the thorax and abdomen and that is succussion. This sound is obtained by giving the body of the patient a quick forcible jerk and this is followed by a splashing sound. If this sound is heard in the chest it is indicative of one disease, pneumo-hydrothorax. The ear must be close to the chest or abdominal wall. It must be differentiated from the splashing sound produced in the stomach at times.

By inspection, we may note the size and shape of the abdomen, also the color. The abdomen may become yellow or splotched in liver troubles. In pregnancy it assumes different colors. It may be slightly yellowish, a brownish and in some cases there seems to be a stasis in the blood vessels from the excessive distension

making it bluish or black. This ditention may cause silvery streak to appear over different parts of the integument, due to an atrophy of the skin produced by the stretching. It may also look like the mesentry with ridges all over it.. Any wasting disease is likely to cause a tensing of the abdominal wall, hence the condition in thin, emaciated people, or those of the tubercular diathesis. Following this we may notice that pneumonia or any disease which causes pain during respiration causes a greater amount of movement in the abdominal region, while any diseased condition in the ~~viscera~~ abdomen or their covering, the peritoneum, causes a tensing of the abdominal wall and restriced motion, just the opposite condition existing in the thorax. (Peritonitis). Many times we may see the excessive beating of the aorta as in abdominal aneurism unless the diameter is two feet, four, as Dr.S.S.Still said to you recently.

As we depend very largely on the touch, palpation is one of the most important methods. In connection with inspection we can tell if any of the hollow viscer are inflated with gas and enlarged Sometimes the solid viscera are diseased and enlarged, especially the liver, or spleen. Again the liver may not be enlarged but shrunken and hardened. The overies in each inguinal region may be located and any enlargement or tumor like growth examined. This is one of the best ways to detect fecal impactions in the colon or twists of the small intestines. The impaction in the sigmoid flexure can be noted every time if you are careful in your examination, unless the subcutaneous fat is too thick. Following the colon around we may detect the position of the splenic and the hepatic flexures. Many times these flexures may be drawn downward from the weight of fecal masses . Byron Robinson says that a dropping of the splenic flexure whether due to nervous troubles or impingement of viscera is sure to cause constipation, which cannot be entirely cured until the colon is made to maintain its proper place. There is one diagnostic point between pain said to be of nervous origin and pains caused by inflamatory or cancerous conditions of the stomach. If it is allayed by pressure, it is said to be of nervous origin, if not allayed, to the other class.

Mensuration I have never used in examinations, although Holden uses the umbilicus as a fixed point for measurments in fractures and dislocations of the hip and femur and other bony points.

Percussion is the method of examination next in importance to palpation. It is best to go over the entire abdomen this way if any suspected trouble. For superficial structures be gentle with your strokes. The liver would give a dull flat sound, while the spleen also gives a similar sound as also the stomach when not distended. The stomach or intestines when distended with gas give a hollow tympanic note. Many times we find the intestines inflated with gas and giving the characteristic sound. I have never used auscultation in an examination of the abdomen except to listen to the sounds of the foetal heart beat in the latter months of pregnancy. Drs.Hazzard and Harry Still say that we may hear a gurgling over the liver. This is frequently the case in liver troubles. This is said to be due to an obstruction of the portal circulation. I have never confirmed this statement. It might be well for you to notice if possible to discover such sounds in your work. There is one precaution, do not confound the gurgling sound of gas in the stomach with or pronounce it the liver sound.

We will now endeavor to map out the position and size of the abdominal viscera externally. The position varies to some extent in different persons and in the same person at different times.

Liver: This organ lies under the right hypochondrium and extende to the left hypochondrium. The left lobe lies immediately behind the linea alba and may extend half way down to the unbilicus This is a good place to palpate to ascertain its condition and degree of enlargement. The extent to which it passes below the ribs on the right side is a variable quantity as to whether it is enlarged and amount of flatus of stomach. As a rule its lower thin border is about an inch below the costal cartilages. You must train your hand to feel or detect this, as the untrained touch fails to distinguish this thin edge. Again if this edge seems lower than normal, it must not be taken for granted that the liver is enlarged, as other causes may press it down. Holden says the habit of wearing tight stays causes it. Cases have been brought to my notice where such a habit has imbedded the ribs, lower ones, into the liver substance, while another one seemed to press a portion of the liver so far down, that the encroachment on the intestines, together with the diseased liver, caused death. We can ascertain only by percussion the height to which the liver ascends. It is in contact with the diaphragm and we have seen that the diaphragm in its movements changes as much as two inches. But its right side may come up as high as the fourth rib, while others say within an inch of the height of the nipple. Posteriorly it comes to the base of the lung, this is about on a level with the 10th dorsal spine, or better the 10th rib. So by percussion we are able to say if the liver is either higher or lower than normal, also if it is both, then we may rest assured that an enlargement exists.

Just to the outer side of the right rectus muscle, and under the edge of the 9th costal cartilage is where we find the fundus of the gall bladder. The bladder may become distended with bile and may be readily discernible, while in other conditions it may be retracted.

The stomach is more variable in size than any other organ of the body. When it is empty it contracts and lies at the back of the abdomen. It is behind the left lobe of the liver and in front of the pancreas. If filled with gas or food it swells up and is close to the anterior wall of the abdomen. It displaces other organs and may occupy most of the left hypochondrium and epigastrium. The distended stomach may cause distressing heart symptoms and palpitation, this is because of the pressure interfering with the action of the heart and lungs. These symptoms may accompany indigestion and flatulence. I have noted several cases where they came for examination thinking heart trouble existed, upon examination I found the heart was all right if the irritation to its nerves and the pressure were relieved. An asthmatic on catching a little cold many times imagines he has serious heart trouble. If you release contractures, stop the irritation to the nerves of the heart, giving it plenty of room to work you see the heart symptoms quickly disappear.(Campbell.) We find the cardiac orifice of the stomach just below the level of the 7th costal cartilage junction with the sternum on the left side. The pylorus is on the right side near the cartilage of the 8th rib, this would be under the liver.

Location of Viscera, Concluded, and Nervous Connections: The pylorus cannot be felt unless enlarged and hardened by disease. The stomach is susceptible of enormous dilation, when the pylorus is obstructed, because of distension it may reach as low as Poupart's ligament. There are some remarkable cases on record illustrative of the capacity of the stomach and its contining foreign substances without seeming injury to it.

The Spleen: It lies in the axis on the 10th rib, extending upward about the 9th rib and downward below the 10th. This is on the left side and you see it is completely sheltered by the ribs at or near the fundus of the stomach. The position and size we must determine by percussion. The upper part being covered by the lung it is only over the 10th and 11th ribs that its dullness is ascertained. If the spleen can be distinctly felt below the ribs it must be enlarged. In proportion to its enlargement, its lower border can be detected below the 11th rib. To make the detection more sure, have the patient take a deep inspiration. The capsule of the spleen contains muscular tissue, hence it must have some contractile power. This may have some influence on the recovery of the spleen after slight injuries.

The Pancreas: It is not accessible to the touch only on very deep pressure with the abdominal contents empty, then it is only recognizable in thin or emaciated people. This organ lies transversely behind the stomach. It crosses in front of the aorta about the junction of the first and second lumbar vertebrae. Hence, if we wish to palpate for it, we would feel in the linea alba about two or three inches above the umbilicus. If the pancreas was diseased and enlarged in thin people, there are two conditions for which it might be mistaken; first, disease of the transverse arch of the colon; second, aneurism of the abdominal aorta.

The common bile duct is covered by, or included in the head of the pancreas. Hence, disease of this part of the gland may result in occlusion or obliteration of the duct and jaundice be the result.

The Kidney: The kidney lies at the back of the abdomen on the quadratus lumborum and psoas muscles. It is opposite the ~~second~~ two lower dorsal and second upper lumbar spines. The pelvis of the kidney is about on a level with the junction of the 1st and 2nd lumbar vertebrae. The upper borders are on a level with the 11th and 12th dorsal spines, the lower border as low as the third lumbar spine. This is nearly on a level with the umbilicus The right kidney is about three-fourths of an inch lower than the left, this is owing to the size of the liver. Generally the only place where the kidney is accessible to pressure is just external to the erecto spinae below the last rib. We must not mistake an enlarged liver or spleen or an accumulation of feces in the lumbar part of the colon for the kidney. Enlarged spleen has a thin and likely a notched edge. This helps in a differentiation.

The Large Intestine: You know the general direction of the large intestine, beginning at "caecum" or "caput coli," this and the ileo-caecal valve occupy the right illiac fossa. The colon passes upward over the right kidney to under surface of the liver; the transverse passes across to the spleen under the fundus of the stomach. You know the course of the transverse colon. (Give it).

The descend ing passes downward in front of the lft kidney to the left illiac fossa where it becomes the sigmoid flexure. All this part of the colon is generally accessible to pressure exeept the hepatic and splenic flexure. The caecum is generally so placed that its apex corresponds with a point a little to the inner side of the middle of Poupart's ligament. It is said a slightly distended caecum may be emptied of its contents by flexing the thigh upon the abdomen, especially if located as stated above. The gradually distended colon may assume enormous proportions. It may not onlt displace certain abdominal viscera but the thoracic organs as well. A case: The heart was displaced, by a distended colon so that the apex beat was found to be one and one-half inches above and one inch to the inner side of the nipple. The fecal contents were removed and the heart returned to its normal position. Hence we readily see how a distended colon may often be associated with shortness of breath, palpitation, and other thoracic symptoms.

The small Intestines: They occupy most of the room below the umbilicus. The ileum contains most of Peyer's patches. The ileum ends at the ileo-caecal valve in the right iliac fossa. Hence the tenderness in this region in typhoid fever..

In ascites the fluid gravitates to the lowest point, the intestines, filled with gas and fastened to the spine by the mesentery, it floats on top of the fluid. By percussion in different postures we can find the fluid changing places. If there is a solid or encysted tumor it cannot change positions, as the ascitic fluid does. The colon on the right side is very close to the gland gall bladder and cases have been found where disease has implicated both gall bladder and colon and caused them to grow together and hence an escape of gall stones and bile directly into colon.

The Bladder: It is generally in the pelvis, may be of a triangular shape when empty. When partially distended it is round, when fully distended it is oval and then lifts the peritoneum from the anterior wall. When distended fluctuation can be obtained by tapping on it in front with the fingers of one hand while the forefinger of the other is passed up the rectum against the bottom of the "trigone."

Nerves and centers for the abdominal viscera and the wall: The abdominal wall receives its nerve supply from the lowest seven dorsal or intercostal nerves and the first two lumbar nerves. The same nerves supply the muscles of the abdominal wall. Hilton states that some of these nerves send fibers to the parietal peritoneum. Hence the association between the skin, muscles and serous membrane. (Case of Joints.)

Next we will go to the nerve supply of the abdominal viscera. Their principal nerve supply is from the sympathetic system. There are also fibers from the vagi and some from the phrenics and others lower down from the spinal cord. In a previous lecture we mentioned the splanchnics, this, including all three splanchnics, gave us only the beginning of the end of these fibers. The solar plexus receiving most of these fibers and then being the origin of numerous secondary ganglia, viz., phrenic, supra-renal, renal, spermatic, coeliac, aortic, superior and inferior mesenteric plexuses.

When we disposed of the splanchnic nerves there was yet left fibers from the first three or four lumbar nerves as passing to the blood vessels, hence one reason why we review the lumbar sympathetic.

Another is the number of subsidiary centers in the lumbar portion of the spinal cord. At the first lumbar we can reach the kindenys, the large intestines and lower limbs. Second lumbar, parturition, micturition, defacation, uterus, kidney, external genitals, lower limbs and large intestines.

The lumbar part of the sympathetic cord sends branches to the aortic plexus, others descend to help form the hypogastric plexus. Hence we see the hypogastric plexus is formed by the aortic plexus and branches from the lumbar ganglia. In the lumbar sympathetic there are spinal fibers from the last two dorsal nerves and the upper two or four lumbar. In these nerves are found a continuation of those found in the thoracic region and vaso-constrictor fibers for some of the abdominal blood vessels. There are also vaso- constrictor and secretory fibers for the lower limb and motor fibers to the circular and longitudinal muscles of the rectum. There are vaso-constrictor fibers for the penis, these fibers spring from the upper lumbar nerves and pass by way of the pudic nerves. Motor fibers to the bladder, these pass by way of the aortic plexus and inferior mesentric plexus. Motor fibers to the uterus having a similar course to those above. Motor fibers to the vasdeferens in the male, and the round ligament in the female. These fibers spring from the first and second lumbar nerves and pass to their destination in the genital branch of the genito-crural nerve.

We will take a note of the sacral nerves. The sacral sympathetic do not seem to play a very great roll in the economy, this I mean in regard to the lateral chain of ganglia. Yet there are fibers in this region through which we may get important effects, pelvic splanchnics of Gaskell. These fibers are equivalent to white rami communicantes, they do not connect with the lateral chain of ganglia but pass directly to the pelvic plexuses. These fibers are said to go to the longitudinal and circular muscles of the rectum. Osteopaths have found that our work may be broader in this region and have the following centers. Lumbo-sacral articulation the 5th lumbar, where we may affect the hypogastric plexus, and thus the pelvic plexuses. The pelvic plexuses are a continuation of the division of the hypogastric plexus. (Contains what fibers.) The branches from these plexuses vary with the sex and correspond mainly to the branches of the internal iliac artery. The haemorrhoidal and vesical nerves are common to both sexes. Those special to the sex in the male are for the prostate, vesicula seminalis and vas deferens. In the female, for the vagina, uterus, ovary and fallopian tube.

To return to the abdominal wall, the intimate association of the nerves of the surface and those of the muscles of this region acts as a protection not only to the wall but to the contained viscera. Where the two parts are thus supplied by the same nerve and the sensory ones very sensitive, they act almost immediately. When the muscles are tensed in contraction, it acts as a very efficient protection from blow to the viscera of the abdomen. Such protection would not be as sure if the nerve supply was independent as then some time must elapse between the warning to the skin and the muscular contraction. These seven lower intercostal nerves supply the lower intercostal muscles and are thus closely associated with the movements of respiration. The abdominal muscles are concerned in the same movements.

LECTURE 38 - 1.

Nerves and Nervous Connections of Abdomen: There are yet other practical points about the nervous associations and expressions of pain on the anterior abdominal wall. One would scarcely think that spinal disease would be mistaken for "belly-ache." There are many such cases recorded, especially in children. Many times a child may complain of pain over the pit of the stomach or about the umbilicus. They think the pain is an evidence of some visceral trouble and proceed to poultice the abdomen carefully. After a while it becomes evident athat the pain is due to pressure on the nerves supplying this region of the body with sensory fibers
28 Also that the pressure is due to some disease of the spine at or near where the nerves make their exit from the canal. Again there may be a sense of constriction about the Body, we are speaking now of the abdomen. This may be rather expressed by a tightness around the abdomen. This sense of contraction depends upon an impaired sensation in the parts supplied by certain nerves. This is a prominent symptom in Pott's disease and is also dependent upon caries of the vertebrae or some injury, so that the spinal nerves suffer as they issue from the vertebral canal. At times this sense of constriction may be misplaced by a sense of pain in the area of distribution. (Give site of painful parts.) There are some nervous diseases, affections of the spinal cord, in which the constricting band is very common. There is yet one more point to be disposed of in this line, as follows; Why should the sympathetic supply for the abdominal organs be derived from a nerve cord which begins more than half way up in the thorax? This could be
29 answered in a sentence, that it was for the purpose of association. Yet a few words in explanation may not be out of order. The splanchnics are the principal nerve supply to the abdominal viscera. These nerve cords are derived from the lower seven or ten thoracic ganglia. The abdominal parietes are supplied, or partially, by the lower seven dorsal nerves. There is a close connection between the lateral chain of thoracic ganglia and these same spinal nerves. 30 Seemingly as conclusive proof of such association and the necessity for it, is illustrated in disease in many ways. In acute peritonitis or laceration of some abdominal viscus the abdominal muscles becme rigidly contracted. This assures as complete rest as possible to the injured parts. We also note that the respirations are purely thoracic, being part of this same association. Of what value is such association to Osteopaths? The splanchnics contain both afferent and efferent fibers. Hence where there are diseased viscera or peritoneum and the impulses from them are carried back over the nerves and affect their spinal connections, by our treatments along the spine or on the abdominal region, impulses that we generate here are bound, by this nervous association to reach the viscera and have the desired effect.

31 Further, the splanchnics contain the vaso-motor nerves to the abdominal blood vessels, especially those to the mesenteric vessels. Those for the jejunum begin as high as the 5th dorsal, while those for the ileum come off lower down and those for the colon still lower, while none arise below the second lumbar (American Text Book of Physiology). These fibers probably end in the solar and renal plexuses. The sympathetic ganglia control the rhythm of the intestines. The blood supply to these ganglia then must be normal as well as to the intestinal wall. Again, if as Byron Robinson states these nerves end in plexuses in the intestinal wall, these plexuses

would be minor ganglia which help to establish the rhythm of the intestines. If there is a lack of blood supply to these ganglia then there is a lack of efficient action on the part of the nerves. There are two things generally given as affecting the movements of the intestines. First, some say an empty intestine is a sluggish one. Second, then if there is a lack of blood supply, the sluggish ness is only increased because of the lack of nourishment to these controlling ganglia. The remedy, in so far as the blood supply is concerned, is found to be in the control we exert over the blood vessels by means of the splanchnics. By releasing contractures and thus inhibiting constrictor impulses we may increase the blood supply to the intestines and also to its nervous ganglia. (This added to its regulative power). There is a point, one on each side of the umbilicus, about an inch distant, that are called by Old Dr. Still peritoneal centers. Here we are able to arrect both the intestines and the kidneys. We make a spreading motion from the umbilicus outward, press deep and spread apart, but be careful not to work too hard. An explanation of this fact might be found in that our treatment here affects the sympathetic fibers around and near the aorta as well as the abdominal nerves.

32 The vaso-motor nerves for the kidneys leave the cord from the 6th dorsal to the 2nd lumbar nerve.(h.) It is thought the splanchnic vaso-motor fibers for the kidney end in the renal plexus. There is a very close connection between the action of the kidney and the state of the abdominal blood vessels. Stimulation of the cut splanchnic causes renal constriction. The splanchnics when intact act as follows: If stimulated there is constriction of the blood vessels in its area, which include those of the kidney and the result is a lessened secretion of urine. Inhibit the splanchnics and there is a dilatation of the blood vessels of the area supplied by these nerves, this will cause an abundant flow of urine. We may also cause vascular dilation of the kidneys by the application of stupes to the skin over them, while the application of cold has just the opposite effect and there is vaso-contriction.

The American Text Book of Physiology says that stimulation of the peripheral end of the splanchnic causes a sudden diminution in the volume of the spleen. There may be two causes for this.
First, constriction of its blood-vessels by action of constrictor fibers contained in splanchnics.
Second, contraction of the intrinsic fibers of the organ. There was one point we were given in school and that was to treat the spleen for gall stones. As to the vaso-motor fibers for the liver, we cannot say much in regard to them. But there is a very close connection between the mesentric circulation and the portal, and that vaso-constrictor fibers for the portal circulation are contained in the splanchnics passing from the cord from the 5th to the 9th dorsal. There are really three sets of nerves through which we may affect the liver, although I am not prepared to state what effects may be obtained through the phrenics. But generally we know that the pneumogastrics cause a contraction of the gall bladder and an inhibition of the sphincter muscle, closing the opening of the common bile duct into the duodenum. Hence the effect on the gall bladder would be obtained through the nerves from the 5th to the 9th dorsal.(Diseases of liver or stomach and reflected pains
The solar plexus and the semilunar ganglia seem to be where many

fibers end and are there reorganized and sent to the blood vessels and different viscera of the abdomen, although before supplying these viscera the reorganized nerves have formed secondary plexuses. This abdominal brain is a great automatic center. It originates or initiates, sustains and inhibits rhythm. Hence any impressions brought to bear upon these centers are sure to produce profound effects. This statement is proven by the effects seen to attend severe injuries to the viscera, such as collapse, vomiting and other grave symptoms. It is also noted that the viscera that are the most directly associated with these large centers produce the most profound symptoms. These great nerve centers lie around the beginning of the coeliac axis and near the superior mesentric artery. The inferior mesentric plexus has but an indirect connection with the solar plexus. The descending colon and the sigmoid flexure are supplied by this inferior mesentric plexus and seems to account for the less serious symptoms often seen in strangulation of the colon when compared with a similar lesion in the small intestines. This point seems to be well taken that the nearer the lesion is to the stomach, other things being equal, the graver are the nervous phenomena produced. (Treves). Some lesions of these nerve plexuses produce pigmentation of the skin. (Addison's disease.).

The preceding points were given for the purpose of demonstrating the effect of a disturbance of any of these nerve centers. That it must be our aim to keep them free from irritating causes both in our own body and eradicate them from our patients. Abdominal tumors are a source of great nervous irritation and may be something that will defy the skill of osteopaths. What are the effects of such tumors? There may be serious pressure symptoms but aside from these, there is a constant source of irritation to the sympathetic fibers near the tumor. These nervous impulses generated so are carried to the centers eventually to the solar plexus, there it is reorganized and it passes out to different parts of the body. It passes out over the paths of least resistance and affects other parts of the body, hence there are bound to be two results following such irritation. First, destroys the rhythm of the centers so irritated and it thus looses control over the part of the body governed by it. Second, because of this dissemination of superfluous nervous impulses distant parts of the body are affected, causing disease of distant viscera. Give the connection between a diseased sigmoid flexure and pain in the knee. The obturator nerve lies beneath the sigmoid flexure, disease or distension of flexure by feces presses upon the nerve and it carries the impulse to the knee.

LECTURE 39 - 1.

Nervous connections and treatments of Viscera: Disease of the bowel may cause pain in the leg by way of the following nervous connections. The bowel is supplied by the pelvic plexuses; these plexuses receive some fibers from the sacral sympathetic ganglia; these ganglia are connected with the sacral plexus of nerves. But the most direct connection is by way of the pelvic splanchnics, these are spinal branches from the 2nd, 3rd, and 4th sacral nerves. These nerves enter into the formation of the great sciatic nerves. Again the lower bowel has the following connections, the hypogastric plexus furnishing many or most of the fibers for the pelvic plexuses and thus to the lower intestine and rectum. The hypogastric plexus is directly connected with the lumbar sympathetic ganglia, which are closely connected with the lumbar spinal nerves as low down as the 4th. The second, third and fourth lumbar ^ Posterior branches of
branches from these nerves enter into the formation of the obturator or nerve. Both the obturator and the sciatic nerves furnish branches to the hip joint and the knee joint and some fibers over the skin of this area. Hence disease of the lower bowel acts as an irritant to its nerve supply, causing an overplus of nervous impulses to pass, by way of the nervous connection, to the obturator and sciatic nerves. 43 Then a dissemination by these nerves to their peripheral distribution. Hence the association of pains in the hip and knee from disease of the colon and rectum. The converse may be true, that disease of these nerves, especially the sciatic may cause pain in the bowel. (Explained as above.).

We will now take up each abdominal viscus separately, give some principal points regarding its examination and follow with the treatment of the organ. We will begin with the stomach. Stomach trouble may be primary and cause symptoms in the different parts of the body, or secondary from disease of other parts of the body and their effects on the stomach. Note the expression of the face if the linea nasalis shows plainly, the eyes, also the color of the face, the tongue, especially those coatings I gave you on the lecture on the tongue, and that it generally affects the odor of the breath. If the teeth are not kept cleansed, the decaying matter also gives an odor, which I think you may distinguish. many times there is vomiting, the belching up of gas and sometimes mouthful after mouthful of watery substance as in pyrosis. I always examine the spine in cases of stomach trouble, and note the condition from the 2nd to the 10th dorsal. If about the 3rd to the 6th there is an anterior tendency, causing tension and contractures, I seldom fail to find that there is belching of gas and rather a dyspeptic condition present. I do not know if other Osteopaths have found this to be the case or not. This does not exclude the possibilities of posterior conditions of the spine, causing stomach trouble. I have seen an 8th dorsal misplaced cause severe stomach trouble, or at least this was the most marked or discoverable lesion. Then you must examine anteriorly to note if the stomach is enlarged, only by percussion are we able to tell the condition of its contents. Palpation should ne resorted to, for finding the condition of the abdominal and stomach walls. The splanchnics and the pneumogastrics are the nerves supplying the stomach, hence through these must we work.

If there is nausea and vomiting we are generally able to relieve it by treating on the right side, inhibiting, between the fourth and fifth ribs near their heads, sometimes it is necessary to go one higher or one lower. (Show how) Relax the parts and press in deeply with the thumb.(Troublesome cases.). There are cases which will not yield to this treatment. Generally give a good treatment to the splanchnics and this has the desired effect. Whenever the contractures along the spine are the principal cause of the trouble, these must be removed. Other causes of nausea caused by uterine congestion or pregnancy, then treatment must be given to the uterine centers. I have seen such cases relieved by treatment in the dorsal region, while at other times it would be necessary to use a local treatment. Why? The vomiting was reflex from the irritation upon uterine centers through the hypogastric or pelvic plexuses. Raise the congested or enlarged organ up from this plexus and the trouble is eased at once. We must not forget that we may reach the solar plexus anteriorly, by pressure below the ensiform cartilage. This is sometimes necessary especially in cases of congestion. We know the solar plexus by means of the splanchnics control the blood supply of this organ and that a stimulation of these fibers would lead to constriction of its blood vessels. Many times, though, there are contractures along the sine, acting as irritants and causing constriction of the splanchnic area. Then our treatment would be to remove this contracture and thus stop the cause of the constrictor impulses. 34 Let us now see what effects we may produce by means of the vagus nerves They contain motor fibers to the stomach and cause contraction of a part or all of the musculature of the stomach. The spincter pylori also. The action of the splanchnics seem to be inhibitory, bacuse, when stimulated, they cause a dilatation of the contracted stomach and a relaxation of the sphincter of the pylorus.

It may be that we inhibit the action of the vagi in our treatment to stop vomiting, as the processes seem to be causes by the coordination of muscles supplied by the pneumogastrics,phrenics, and spinal nerves supplying the abdominal muscles. It may be by inhibiting the vagus nerves we may relax the pylorus and in this way rid the stomach of its contents. There are two or three places where we may treat these nerves to advantage. I have shown you one place between the 4th and 5th ribs. We can also reach them along the side of the neck and just back of the clavicle and near the first chondro-costal articulation. These nerves may be irritated at the atlas articulation by a misplacement. There is a treatment I have seen Mrs.S.S.Still give for the stomach and to help rid it of irritating contents. One hand toward the fundus and another at pylorus. Press the hands together and then pull the contents toward the pylorus. Another given similar to that one, we give to the liver and gall bladder by raising the ribs.

We will now consider the liver. In our landmarks we were made familiar with its location and normal position in the body also that its location is very variable. You was told how to percuss for the liver and get its location and determine if it was enlarged In diseased of the liver we may notice a yellowish discoloration of the skin and also of the conjunctiva. Also that many times we find it very tender about the situation of the gall bladder and that this seems to be the case where there is alternate diarrhea

and constipation. The complete occlusion of the bile ducts soon causes jaundice. The bile is absorbed by the lymphatics of the liver and in this way gets into the blood. These ducts are lined with mucous membrane and are liable to catarrhl conditions the same as mucous membranes in other parts of the body. So that a plug of mucous may shut up the duct. Again the formation of gall-stones may take place in the gall-bladder, then when attempting or actually passing down the duct shuts of the flow of bile and causes jaundice, also very severe pain while the stone is passing. We have once spoken of the connection between the portal and the hemorrhoidal circulation. 36 Remember the formation of the portal vein, and we note that the inferior mesentric vein starts at the rectum, including the hemorrhoidal veins. Hence if there is a congestion of the liver or a plugging of the portal circulation it may lead to a filling up of the hemorrhoidal veins and in this way lead to a filling up or formation of the hemorrhoids, or piles. The liver is very liable to become congested and as the splanchnics contain its vaso-motor nerves and also the vaso-motor nerves of the rest of the abdominal viscera, we would hope to overcome this difficulty by a treatment on the splanchnics. (Regulative).

In our treatment of the liver we have three sets of nerves as given you previously. We must treat along the spine from the 5th to the 9th dorsal. You are all familiar with this treatment and how to give it. Also cases of sick-headache it is best to treat both the liver and the stomach. Many times a diseased liver causes a rushing of blood to the head and eye troubles, so that the sick-headache is only a little more severe. We may use the splanchnics here in their regulative capacity. The peritoneal center given you will also affect the liver as also affecting the vagi. We know how to reach the pneumogastrics and that we may by stimulating them, squeeze the contents of the gall bladder while at the same time it opens the ductus communis choledochus. Now place the patient on the back, one hand on the lower rib angles and the other under the cartilages of the lower ribs near the gall bladder. Sometimes it is well to squeeze the liver by compressing the right side of the chest, the lower ribs rather.

The fundus of the gall bladder can generally be detected about the 9th costal cartilage. You must note the direction of the cystic duct and then the common bile duct, there you are able to treat gall stones knowingly. Two treatments: First, for the pain when they are passing and also to help their removal. Second, the treatment to prevent them from forming again. (Give and explain this.)

The next, treatment of the spleen. We have located it and also how to know that it is enlarged, and a distinguishing feature of the spleen, if so enlarged as to be felt below the ribs, is its notched border. We are very likely to find tenderness along the spine on the left side. You are familiar with the treatment we use to prevent this tenderness. We must also raise the lower ribs, the 10th, 11th and 12th ribs; also give a similar treatment on the left side of the spleen that we do on the right side for the liver and gall bladder. In malaria and chills and fever we are very likely to have an enlarged spleen, sometimes called ague-cake. We will enlarge on this in the next lecture.

lecture 40- 1.

Spleen completed-Malarial Conditions & The Kidneys.

We will say a few more words in regard to the spleen. There is likely a governing center in the medulla and a slip in the first vertebra may cause an irritstion to the sympathetics or may affect the center in the medulla. Stimulation of the splanchnics causes a contraction of the spleen yet the splanchnics may be cut and no dilation take place. A cold, clammy perspiration is said to be noted on the left side of the body, when the spleen is diseased, although this is not a general rule. As the splanchnics control the blood supply of the abdomen we cannot but hope to affect the spleen by treating these nerves.

Just at this point it would be best to consider the theory of our work in regard to malaria, chills and fever. This is manifest at once when we call to mind the fact that the spleen is enlarged and swollen while the liver is engorged during the paroxysm of fever. Bilious fever is closely akin to the above. I shall not enter into any description of these diseases as you will get that in your symptomatology. Yet it is best to note the theory of our treatment in such cases. We will speak first when we have it appearing in the paroxysms. The chill. This is caused by a loss of equilibrium of the heat center. There is a great difference in the external and internal circulation. The external seems to be very much constricted and lessened amount of blood contained in these vessels. There is just the opposite condition present in the blood vessels internally. There is a congestion of the liver and spleen and sometimes of the thoracic viscera. These points being where there is the most noticeable congestion. There are times when this congestion extends to the alimentary canal. Our work is to equalize this blood flow, that is remove or relieve this internal congestion. The proper way to do this is to stimulate the superior cervical ganglion, and the lungs. You can best stimulate the lungs by spreading and raising the ribs from the second to the seventh D. It may be necessaryto give a thorough stimulating spinal treatment along the entire spine for the equalization of the circulation. In cases I have treated, if I could see the patient at the beginning of the chill, I released the drawing or stiffening of the muscles of the neck I have succeeded in several instances in stopping the chill. Principally by the treatment in the neck which I followed with the general spinal treatment. If the chill is cut short by the treatment, the fever which follows is not so high as it would be in the regular course of the fever. The next point is to treat the fever when called in at or after the beginning of the second or fever stage. We want to get rid of the poison and to quiet or get rid of the fever. The excretory organs, the lungs, the liver, the kidneys and the bowels must be given a stimulating treatment, as it is by means of these avenues we hope to get rid of most of the poison, although there is one other avenue through which a great part of this elimination takes place, that is, by means of the sweat glands. Now as to the treatment of these several organs. We have seen how we are able to reach the lungs and we will not take the time to repeat. The liver also, at our last lecture, was brought to our notice. We have not gone into the special treatment of the kidneys and the bowels, but will do so soon. This much we know, the splanchnics.have control of the blood vessels of the kidneys and the bowels, hence our treatment is mostly through or by means of these nerves. I think you would be able to give them the necessary treatment, not forgetting the tenth dorsal nor the fifth lumbar. In our treatment of the liver and the spleen we must be somewhat careful. They are juch enlarged and engorged with blood and if much pres-

sure was used we might rupture these organs causing a very serious condition. Do not omit the treatment of the peritoneum. I have found it very beneficial in such fevers. We would treat for the fever itself as we wish to slow the heart's action and reduce the temperature. You know one of the best ways to slow the heart's action and reduce the temperature is by inhibiting impulses passing to the heart, by pressure on the sympathetics at or near the annulus of vieseseus. Also inhibit the superior cervical and the lower lumbar regions. It may also be necessary to use sponging and cold drinks.

In the third or sweating stage it is best to let the patient be quiet unless to give plenty of water and to encourage the sweating by warm coverings. This would be about the manner of our treatment given during different stages of the disease. Our main work must be done between the paroxysms. It is to rid the body of the poison. We outlined the method of treatment in the beginning of this lecture. That is, that all the excretory organs must be treated thoroughly. In cases of malaria when taken at the beginning we are able to handle them quickly. Let the system get thoroughly saturated with the poison, then a cure is more difficult. It may take a series of treatments lasting from one to three months or more.

There is a variety of malaria which does not have the normal sequence of chills, fever and sweats. The symptoms are rather irregular chilly sensations , flushes, neuralgia, pains in joints and muscles, headache and sometimes bronchial troubles. This is called the "Dumb Ague". It used to be very common in Missouri when the prairie was being first settled. (Case in point, F.)

The kidneys, we have in a previous lecture located and stated the place at which they are most accessible to pressure. Note the look of the eyes and the color of the face. If there is any puffiness under the eyes, when kidney disease has progressed considerably, there may be fever, suppression of urine and a weakening of the whole system. Sometimes it leads to such trouble in the eye, that there is a gradually growing blindness. I always examine the spine. If there is trouble at the eleventh and twelfth dorsal there is very likely to be trouble with the smallest or renal splanchnic. There may be a break at the second lumbar, this may also affect the kidneys or its connected organs as this is the micturition center Again there may not be so much of a lesion of part of the spinal column, as there are contractures in this area. It is said that a lesion or a small misplacement of the atlas as well as contractures in the sub-occipital fossa may affect the kidneys. There is a renal center in the medulla, hence a lesion such as misplacement or contracture is likely to affect this center.

If from the history of the case or from the examination or from both, there was a probability of kidney troubles I would surely examine the urine. This may save a person from a mistaken diagnosis or confirm us in one which we have every cause to entertain.

We must remember the effect the splanchnic nerves have on the kidneys as it is through these we may readily reach the kidneys (place of origin from cord). As to the the manner of the treatment, place the patient on the side and treat from the second dorsal to the second lumbar. This will include the vaso motor nerves as they spring from the cord between these two points. Concentrate most of the work, if at any points, at the eleventh and twelfth doraal and the second lumbar. We are very likely to get vaso motor effects at this point. After treating on one side turnthe patient to the opposite side there we can get at the side not treated. At the same time we can each the fingers of one hand over the spines and spring upward while using the limbs as levers. This will spring the spinal column, so as to release contractures and stretch the ligaments of this part. You may now turn the patient on the back and placing the fingers along the spine near the renal splanchnic area, spring upward and outward with the hand. Or you may place the knuckles on the table under the patient the fingers against the part of the spine mentioned, then by raising the limbs toward the head, this causes a springing of the spine against the hand on the table. This is a good treatment and can be used to advantage in rheumatism.

Anteriorly we may affect the renal plexus by pressure at the points mentioned as peritoneal centers. I have shown you how to give this treatment.

There may be dissase of other parts of the body causing kidney troub
e or of contiguous viscera bringing pressure on the renal vessels or ir-
itation to the renal nerves. In such cases we must treat for the pur-
ose of removing the cause and thus rid the patient of the disease. This
nly illustrates the point that we must look for the lesion. The lesion
ay be at the center, above or below it. Locate it and then remove it and
ur work is well done.

As an adjuvant for a general treatment of the kidneys, have the pa-
tient drink plenty of water. The best time to take it is about half hour
before breakfast, it is said to cause a flushing of these organs. In some
diseases it is recommended to keep the patient on a milk diet exclusively
for weeks. Chronic Parenchymatous Nephritis. I would advise you to note
the difference between this disease and chronic Interstitial Nephritis.

Treatment of renal colic: This is the name given to the pain caused
by the passage of stone along the ureters. These stones are gener-
ally caused by the kidneys not doing their proper duty and that the urine
is very acid. The ureters start from the pelvis of the kidney which is
just above the level of the mubilicus about two inches externally, and
passss downward and inward to the base of the bladder. The two where they
empty into the bladder, forming the upper and backward boundary of the
trigone. The passage of a stone along these channels causes Excruciating
pain. Our work would be to help the passage of the stone into the blad-
der unless it has just started when we might try to work it back to the
pelvis of the kidney. We cannot bring direct pressure to bear on the
ureters but we can bring pressure on them by pressing deeply along their
course. This trouble may be in the shape of very small ones called sand.
Our treatment is two fold whether large or small. First, to allay the
pain by treating along the course of the ureters and the centers poster-
iorly.

Second, By giving the proper treatment to prevent the formation of
these stones or gravel. (Explain).
Case of suppression of urine in fever and how to handle.)

36 Theory of Rheumatism and Connection with Liver and Kidneys:

Rheumatism is a disease which is met with very frequently, in a variety of forms. Because of the seeming connection between this disease and an improper working condition of the liver and the kidneys, it is rather in the order of things to discuss the theory of rhumatism at this time. There are several different forms. We see the effects of this disease as pain, enlargement of joints, deformities and even death. Many of these cases may be beyond the skill of the Osteopath, especially to complete a cure, yet if we work on a reasonable basis many cures will result.

There are at present three principal theories as to the cause of the disease. First the theory that the presence of lactic acid in the system is the cause. The promoters of this theory say if lactic acid is injected into the system rheumatism follows. Second, That it is caused by a miasm. The poison is generated out of the body and seems to affect the system something in the manner of the malarial miasm. Those that uphold this theory believe that the lactic acid found in the system is the product of the rheumatism, instead of it causing the rheumatism. Third, The nervous theory is that the sxciting causes, wet, colds, chills, strains, etc, produce an impression on the surface of the body which is carried to the vaso-motor and trophic centers by the afferent nerves. This affection of the vaso-motor and trophic nerves is shown by diseased tissues. Thus we note that authorities are divided as to the nature of the disease. It may be that we cannot attribute it entirely to any one theory. Yet by looking at some of the facts we might work out a theory that would be possible. It seems that there are two places in the body that we may have the formation of lactic acid and that which is an isomeric form of this acid, viz;sarco-lactic acid. One may be from the excess of carbohydrate food, as this acid comes from the sugars. Hence its presence in quantities shows there is some trouble in the normal metabolism of the body. The liver normally takes care of the carbohydrate foods, that is,it is passed through the portal system before assimilation takes place. There are trophic nerves to the liver and in fact to all parts of the body. Hence from any of the causes given as exciting, these should affect the vaso-motor and trophic nerves of the liver, then the regular duty of the liver is not performed and the metabolism of the body is interfered with and leads to disease and why not to rhumatism and the formation of lactic acid. Again in the muscles of the body,the isomeric compound sarco-lactic acid is formed. It is noticed where a muscle is worked to excess it is given no opportunity to rid itself of the products of metabolism, hence the greater amount of this acid. The muscles are the seat of glycogen formation as well as the liver If there are conditions calling for increased oxidations in the body, especially violent muscular exercise, the amount of glycogen is decreased as it is changed into dextrose and the dextrose is used in the oxidation. There may be a normal amount of this acid formed and no difficulty be noted. Here is where we note that this lactic acid and sarco-lactic acid may very likely come from the glycogen indirectly . (Is it so?) That is, the glycogen is changed into dextrose and the acid is from the dextrose. If the metabolic process of the liver is at fault, the glycogen may not

be formed and an excessive amount of lactic acid may result. This is number one. There may be an excessive amount of sacro-lactic acid formed in the muscles.(Trophic changes.) Then, for the body to be kept in a healthy condition, the kidneys must do their proper duty and eliminate the substance. An excess of acid is found in the body during rheumatism. Here again may we not touch the vaso-motor and trophic nerves. As these exciting causes before mentiond ed may affect both the vaso-motor and trophic nerves of the kidneys the result is that the effete substances are not eliminated and disease is the result.

If we take note of the malarial theory then it is shown that the liver is at fault. Would the liver be at fault if controlled properly by its nerves, the vaso-motor and trophic?. We do not find any organs of the body but that act properly if their blood supply and nervous forces are unhampered.

It would seem to me then that the more reasonable theory is that of the nervous, in that exciting causes may affect the vaso-motor and trophic nerves and cause the disease. We will recapitulate. If from cold and wet, strains, overheating, as from excessive muscular exercise, exhaustion, mental effects, etc, these produce effects on the vaso-motor and trophic centers of the tissues and especially the centers governing the liver and kidneys, may we not have the conditions stated above? That from a disturbance of the metabolism through the loss of nervous control to the liver and the musculature of the body may follow the formation of excessive amounts of lactic-acid. Also this same disturbance affects the kidneys, disturbing their equilibrium and preventing the eliminating of substances necessary to be carried away. Why this happens to result in rheumatism, I cannot say no more than I can say why typhoid fever happens to run a particular course and affect particular parts of the body. To strengthen this theory is the fact of there being trophic nerves in the muscles. We noted this fact in previous lectures, also that if the motor nerve to a muscle be cut , the muscle would deteriorate or degenerate. That this was first shown by the muscle getting flabby while later it might assume other conditions.

I do not ask you to accept this theory, nor am I positive that it accords in every part with physiological and chemical laws. I do think it worthy of your notice and further study as it may lead to the formation of a better. From the above we are able to select the line of our treatment. We are able to note the organs upon which most of our treatment is to be concentrated, although all excretory organs must be made to do the full share of the work in the metabolic changes of the body.

Treatment of rheumatism differs somewhat as to whether it is chronic or the acute form. In the acute form rest in bed is the best, as warmth is imperative and a light diet, easile digested. We must treat the fever and it may be necessary to treat the cutaneous nerves from or near the centers. It may be necessary to use warm or hot fomentations on the affected joints.

It may be necessary in some forms of rheumatism, the muscular variety, to trace the nerve supply from the affected parts to the center. In the shoulder we find this trouble frequently. Trace the nerves to their origin in the cervical region and here we generally find the lesion, although there may be trouble at the

shoulder. Many times sciatic nerve troubles may be located in the same way. I think we have mentioned that trouble in the lower lumbar or sacral region, or disease of some of the pelvic visera may affect this nerve.

Now as to the treatment of the chronic form. A thorough examination of the patient will very likely reveal to us the manner of procedure. Many times there is a great deal of pain, hence the treatment at first must not be very strong nor a very long one. We must endeavor to relieve the pain. The remainder of our treatment consists in treating the kidney, liver and the bowels. Where the joints are enlarged or have deposits it is necessary to treat them directly. The treatment of the liver is to get it to again perform its proper work of elimination. We want to treat from the 5th to the 9th dorsal. We must treat the right side and raise the ribs from the 8th to the 12th on this side. The liver is frequently enlarged in rheumatism and calls for special treatment to overcome it. Next our work must be directed to the kidneys? They are not performing their regular excretory work. The nerves to the kidney by way of the splanchnics are from the 6th dorsal to the 2nd lumbar. The work should concentrated at the 11th and 12th dorsal and second lumbar. The bowels must be kept in proper condition and by way of these avenues we can rid the system of the poison and succeed in getting the organ in a proper working condition.

Now our treatment on the joints. The worst cases I have treated are those where the lower limbs were flexed, at the beginning of the treatment, to an angle of almost eighty degrees. We worked the hip joint well by bringing it up and around and removing any difficulty, as contracture, at or near the saphenous and femoral openings. (Springing limb outward) At the kneee was where considerable work had to be done. Pulled out by straight pull as far as could be done. You must spread the hamstring muscles, work outward on the tissues of the joint, separating them and stimulating both the blood currents and the nerves to the joint. In cases where the ankle is enlarged and stiffened, you must give a rotary, a flexion and extension alternately. I have held the head while Dr. Wilson has pulled on the feet, exerting nearly all his strength for the purpose of extension at the knee. Remember you cannot begin in that way. You must begin with easy treatments and gradually accustom the patient to the treatment until strong ones can be given. In a case I am treating at present the arms and hands have to be released of contractures. I put one hand along the spine between scapulae and then draw the arm up, around and down. Follow this by stretching the axillary and brachial arteries. Do this by drawing the arm backward, upward and outward and take one hand to work along the course of these vessels. Then if necessary to spring the shoulder joint you may have the patient sit on a stool, place your knee in the axilla and then push the arm down close along the side. At the elbow we must spread apart the tissues and get a springing motion for the bones. This materially aids the circulation there. When the fingers are stiffened, get white then blue, it indicates a very low state of circulation in that part. You may succeed in producing a glow if you will spread the metacarpal bones in this manner, follow this with alternate flexion and extension of the fingers. Also give a rolling motion to the hand.

LECTURE 42 - 1.

The Intestines: To-day we are to note the nervous control of the intestines and get the proper theory of our work on these tissues. I do not intend to enter into a discussion of any diseases of the intestines such as we get in a work on the Theory and Practice of Medicine. We will first speak of the nervous supply. But I wish to introduce a term used by Byron Robinson, that is: "Fecal Reservoir." By this he means the left half of the transverse colon, the descending colon, sigmoid flexure and the rectum. You will notice that most of this fecal reservoir is that part of the intestine supplied by the inferior mesentric artery, in fact, all unless the last portion of the transveree colon. The rectum receives a blood supply other than the inferior mesenteric in that it gets two vessels, one from the anterior trunk of the internal illiac and the other from the same trunk but through its internal pudic branch. This is indicative of the double nerve supply of this part of the canal. More than the rectum, according to Langley and Anderson, receive a double nerve supply, the descending colon as well. They give this supply as follows; 1st, From the lumbar spinal nerves from the 2nd to the 5th. These fibers pass through the sympathetic ganglia, hence to their destination through the inferior mesenteric plexus. Thus you see their destination is the same as that of the inferior mesenteric artery and their function seems to be of an inhibitory nature as they chiefly cause inhibition.

Second; Fibers from the sacral nerves. They pass by way of the nervous erigens then through the hypogastric plexus to their destination. The function of these fibers seems chiefly to be in bringing about a contraction of the circular muscle.

In the other part of the intestines, that is, all of the small intestines and a part of the large, the viscero-motor fibers are from the vagi and the sympathetic chain. The vagus nerves end in the solar, hepatic, Coeliac and splenic plexuses. The sympathetic fibers emerge from the spinal cord in the 6th dorsal to the 1st lumbar spinal nerves and pass to the sympathetic chain in the splanchnics, which end mostly in the semilunar plexuses. This makes the two sets of fibers meet in the same ganglia. Most observers consider that stimulation of the vagus fibers cause movements of the intestines, hence they are regarded as motor fibers. It is undoubtedly true that these nerves (the vagi) carry inhibitory fibers as well (this is only in some animals) and that the motor effects usually obtained on stimulation are due to the fact that the motor fibers predominate. The sympathetic fibers when stimulated give mainly an inhibitory effect although some motor fibers apparently take this path. (Am. Text Book Phys.)

The large ganglia, solar, semi-lunar, coleiac, etc., send fibers send fibers to the intestines which form plexuses in the wall. The first is between the muscular coats called Auerbach's. These ganglia give rise to branches which supply the muscular coats of the intestine and in or upon the submucous coat form secondary plexuses or ganglia called Meissuer's Plexus.) These are called the extrinsic nerves of the intestines and serve for the purpose of regulating the movements of the bowels from the central nervous system. In the case of the stomach, it is found that its nerves have only a regulatory influence. That means that when the nerves to the stomach are all cut, the tonicity of the wall is not altered and peristalic and rhythmatic movements may still occur. In the

case of the intestines it is thought that these nerves control the movements of the intestines, as the movements of the heart are controlled through its extrinsic nerves.

Byron Robinson has built up a theory in which he says that Auerbach's plexus controls the movements of the intestines and Meissner's plexus controls the secretion. Also that two things influence these plexuses. (a) . The amount of blood in the intestine. (b) Stimulation of these parenchymal ganglia. Then by proper work on these plexuses he says we can control the bowels. By increasing the blood flow to Auerbach and stimulating it we may increase the movements of the intestines. We may decrease the action of the intestines by producing the opposite condition. (Explain idea with regard to secretion.)

A word as to this theory. It is a very nice one but we can quote no authority, physiological, for the proof of such an one. In fact it seems that he has taken it for granted that Auerbach's plexus controls motion because it is between the muscular coats. Yet no physiology that I know of give such a statement any weight. They say we must wait for more complete investigations upon the physiology as well as the histology of the muscle and nerve tissues of organs constructed on this type. The same statements hold good in regard to his saying Meissuer's plexus controls secretion. There is abundant evidence for his saying the amount of blood in the intestine affects its motion and secretion, not only the amount of blood but the quality of the blood as well. If the blood supply is suddenly shut off there are violent movements of the intestines, also when the blood supply is re-established the movements are increased temporarily. Gas within the bowels, oxygen suspends the movements, carbon dioxide, (methane gas), and hydrogen sulphide acts as stimulants increasing the movements.

From the foregoing we would note that if we wish to increase the action of the intestines it would be necessary to stimulate the vagus nerves or to inhibit the splanchnic nerves. Again, if we wished to quiet the action of the intestines it would be necessary to inhibit the vagus nerves or stimulate the splanchnic nerves. It must be remembered that the vaso-motor nerves for the area pass by way of the splanchnics and that when we stimulated the splanchnics for the purpose of inhibiting the action of the intestines, we may stimulate the vasoconstrictor impulses and cause a contraction of the arterioles of this area, hence a lessened blood supply. On the other hand, when we inhibit the splanchnics for the purpose of increasing peristolsis there is a dilatation of the blood vessels of the area and an increase in the blood supply of that area. It would seem to appear that increased movements and dilatation of the blood vessels of this area normally take place at the same time and a slower movement is accompanied by a lessened amount of blood. These two statements would necessarily be true unless some causes or stimuli only act on one of these sets of fibers, that is, on the vaso-motor or on the inhibitory fibers of the intestines. This might be possible.

We are generally able to make most of our work and our theory agree with physiological laws. Here is one place where physiological laws and theory seem to be set at variance by results obtained in practical work. I will explain. You are called to treat a patient who has spasms or cramps of the intestines It may be there-

is tormina accompanied by tenesmus. What is the treatment given in such a case? We are very likely to inhibit that part of the splanchnic area which has the most direct control over the part of the bowel affected. It seems to be inhibition, as there is steady pressure on the nerves along the spine, it has been successful in stopping the pain and quieting the action in all cases I have heard of the treatment being given.

37 Now, according to the physiological facts given above the result of an inhibitory treatment of the splanchnics would be to shut off inhibitory impulses and allow the intestines to go on a worse rampage than before. How are we going to reconcile the two statements? I must say first that we know the treatment succeeds in stopping the trouble. Next, physiologists are agreed on the part that these nerves control in the blood supply of the intestine as stated, but as to the control over their movements, they put a big doubt. If the splanchnics contain motor fibers as was mentioned, then we would be able to obtain the result mentioned through those motor fibers, hence there would be no variance. If, on the other hand, they contain no motor fibers, then we must look elsewhere for an explanation. It might be found in this: The presence of oxygen in the intestine has a quieting effect. By inhibition a dilitation of the blood vessels of this area takes place. A greater amount of oxygen is thus carried to the intestine and may in this way act as an inhibitor of excessive action.

This point might be raised here: That for the proper action of the parenchymal ganglia the blood supply must be plentiful, and that increasing the supply would only increase the difficulty. I cannot look at it so. If these ganglia cause the rhythmic movement of the intestine, unless there is a normal blood supply they are not doing their proper duty and that it might be the effect of deoxygenated blood that was causing their excessive action, hence when the blood supply was increased the cause was removed, the ganglia gained control of the vessel walls and a normal rhythmic movement is the result. Nor do I believe that a treatment that would seem to send an overplus of blood to the intestine would be detrimental. There might be a question as to whether ~~was~~ are really inhibitory in its effects. I know some of them are, in that steady pressure is given which would shut off impulses. At other times we may give a movement, with our pressure which may have the effect of releasing nervous impulses and in this way result in a stimulation of the fibers. It seems to me this idea would lead us into deeper water than before, as it would necessitate there being some inhibitory influence at work on these nerves before. In our examinations, if we find contractures or other lesions, they seem to be of such a nature as to act as irritants. Hence instead of an inhibitor of impulses they would act as stimilators and would thus put us in the light of increasing the existing condition. In spite of the above we generally consider that the splanchnics are the inhibitors and the vagi are the stimulators of the intestinal mogements. If we are to be sure of the effect obtained by our treatments we must carefully note the condition of the parts before treat. Again it must be remembered that the greater portion of our work consists in removing lesions and hence a return to normal action. (Might it not be so with the treatment spoken of.)

A point here that we might have mentioned when speaking of the liver, the treatment for Entozoa. The entire alimentary tract must be kept healthy, but to get rid of the worms we must treat the

liver. Stimulate so that we get a good flow of bile, this will cause the bile to act upon them and the patient is soon rid of the difficulty. Some persons are troubled with soreness across the body just above the umbilicus and periodic spasms of the intestines This generally follows some indiscretion on their part either in eacting or excessive exercise. (Case of violent exercise after a meal.) If from over-eating, after the spasm is over there is generally a soreness and tenderness of the abdominal wall noted. By treating over colon this may be made to disappear. Sometimes necessary to treat the spine.

38 We will now consider the three diseases with which the intestines are mainly troubled, viz: Constipation, flux and diarrhoea. Constipation first: This is a retention of the contents of the bowels. It may be due to functional inactivity of the intestinal canal or to abnormal biliary or other secretions. There may be obstruction of the canal. This may be brought about by eating of certain foods. A Paresis of the intestinal canal may be the cause. From an osteopathic standpoint there may be a number of causes but they affect either the blood supply or the innervation of the intestinal wall. A lack of blood supply causes a sluggish bowel. You remember in the first part of this lecture where it was stated that if the blood supply was shut off there was caused violent intestinal movements, this meant that the condition happened rather suddenly. There are two reasons why this lack of blood supply causes a sluggish bowel. First, the effect a lessened amount has on the parenchymal ganglia. Second, the effect on the nutrition and secretion of the intestines. Again, some lesion may affect the nerve supply of the intestines and in this way cause constipation.

The circulation of the blood through the intestines is mainly what influences peristatis, hence any disorder in the blood supply leads to disordered peristalis. The blood supply is controlled by the sympathetic nerves so that we might say primarily any lesion to these nerves, especially the splanchnics, affect the bowels. There may be some lesion along the spine. This may be in any part of the splanchnic area from the 5th dorsal to the 1st lumbar and is likely to cause constipation. The lesion to the splanchnics may be such as to affect the liver and pancreas in the formation of their secretions. A lesion of the solar plexus may act in a similar manner and cause constipation.

39 That part of the intestines called the fecal reservoir, (give it) so called by Byron Robinson, may be more readily affected by spinal lesions, it seems to me, than other parts of the bowel. This is the part supplied by the inferior mesentric ganglion and a greater portion of it seems to have a double nerve supply from the spine. Hence you can see why osteopaths designate some points along the spine as centers and of greater importance than others. These we will speak of in our next lecture.

LECTURE 43 - 1

40 The centers of which we spoke in our last lecture were the 2nd, 4th and 5th lumbar also 4th and 5th sacral. The 2nd lumbar is the defaction center, you remember there we get fibers that pass to the rectum, the result of which is inhibition. The 4th and 5th sacral are the fibers that control the spincter ani.

In your anatomy likely you have noticed the picture of a transverse colon forming almost a V. There is a loss of tone in these tissues and ligaments because the nerves of this area, the abdominal sympathetics, are at fault. This will cause a dropping down or loosening of the structures, which is called enteroptosis. Whatever may cause a disturbance of the rhythm causes disease. There may be such an irritation as to cause an increased peristaltic action, yet cause a contraction in the arterioles of this and consequently lessen the secretions and result in constipation. I will not dwell any further on this except to say that constipation may be considered as a neurosis of the intestinal canal. A lesion along the spine, by affecting the nerves connecting with the sympathetic may interfere with both the blood and nerve supply of the body and in this way affect the rhythm of the bowel. Many of the lesions which werementioned when we examined the spine may lead to a constipated condition. There may be a rigid spine affecting the bowels similarly. Now as to our treatment. First it would ne along the spine. Here we treat for the purpose of removing all lesions and thus ridding the nerves of all irritation. We would place the patient on the side and release all contractures and if the spine seems very rigid reach over the spines and spring them upward. Note carefully the position of the 2nd and 5th lumbar. If the 5th lumbar is misplaced anteriorly we may flex the knees and by using the muscles pull it to the proper position. The second lumbar, as it is athe defacation center, must be put in a proper condition. After relaxing the parts thoroughly you may attempt to replace any vertebrae that may be lateral or posterior. This may be done with the patient sitting on a stool or lying on the table. You know how when the patient is sitting to exaggerate the condition then to turn to the opposite way, thus getting an elastic rebound. There is a treatment I have shown you but not given in th the course of lectures, that is, to replace lumbar vertebrae being lateral. Put the fingers of one hand on the great trochanter, the thumb pressed against the vertebra, making a fixed point, then rotate the body, having the other hand on the other side of the vertebra to exert pressure, and in this way work them in any desired direction. Another way in which we may loosen all the lumbar vertebrae and lower dorsal is to reach around the patient so, beginning at the lumbo-sacral ligaments, first relax them by flexing the body to the side on which your fingers are placed. T Then hold firmly by the side of the spines while raising the body upright using a rotary motion. This effectually loosens all contractures of the ligaments and seems to draw the vertebrae apart slightly. This is one of the best treatments we can use. Nerve impulses have avenues opened which may have been effectually closed to them and the blood current now may reach the spine and properly nourish and carry away the results of metabolism. It also results in affecting the hypogastric plexus. You remember in our lecture on lesions the 5th lumbar was .. the point so named for this plexus

The result of stimulation of these fibers is to cause contraction of the circular muscle. Very likely we may attain the same result by working on the sacral nerves 2nd,3rd and 4th.

As to our treatment on the liver it is similar to that given you for rheumatism. This will increase the flow of bile, which acts as a cathartic to the system. Now you may place the patient on the back with knees raised to loosen the abdominal wall. We may work along the entire course of the colon beginning at the sigmoid flexure deeply in the left iliac fossa. This has a two-fold effect. First, to mechanically break up fecal masses and start them along. Second, to stimulate the sensory nerve endings of the abdominal wall and thus affect the nerves of the viscera as well as treatment very near to some of the sympathetic centers. While the patient is in this condition we are able to get at the gall bladder to the best advantage. Note the warning I gave you, in that, when the liver is congested you must be careful not to injure it in any way by severe treatment. Work on the peritoneal centers thus stimulating the parenchymal ganglia. Have the patient on the left side, you stand behind them, reach over into the right iliac fossa and raise up on the colon and caecum. This will draw the inteatines to their proper position, smooth out any kinks and get a direct effect on the sympathetic parenchymal ganglia. Turn the patient to the opposite side and do likewise. Here we may hope to accomplish more then on the right as the sigmoid is more likely to be folded on itself or kinked and the mechanical effects obtained are greater.

It is well now to apply the treatment to the coccyx and rectum if necessary. So many times the coccyx is misplaced presenting a mechanical obstruction as well as a source of irritation to the numerous nerves of this area. Examine digitally and then you may exert pressure in the proper manner to replace. In little children you are likely to find cases in which the external sphincter is too contracted. Then it must be dilated. Be careful and bring this about gradually. This treatment is a powerful stimulant to the sympathetic nervous system and you must be judicious in its use, gradually stretching the muscle. At the same time it is well to give a treatment along the front of the coccyx, smoothing out the tissues there.

Note the condition of the upper rectum. In many cases you may find it prolapsed. This may be caused from a lack of nerve force, as in a paretic or paralyzed condition, or the bowel, from a consti pated condition, is pulled down by the weight of accumulated feces. A local treatment is generally necessary for this, coupled with the treatment given in the left iliac fossa. It raises and straightens these parts of the bowel. You may find such a condition existing where the rectum seems all falled together, and in this way obstructs the passage of fecus. Too much hot water used as an enema is detrimental. It decreases the tone of the bowel wall. In speaking of the liver treatment I should have mentioned the vagus nerve. You know where we reach it in the neck near the edge of the sterno-mastoid muscle. It also increases the peristaltic action of the bowel through its viscero-motor nervesfibers.. Regularity is one thing you must insist upon in nearly all cases of constipa-

tion. The bowels when once established in a habit may be kept so. This is establishing a rhythm. By a person not attending to the needs of the body the rhythm is overthrown and sometimes not so very easy to establish. There are cases on record of a constipated condition being cured by the reestablishment of this rhythm by the influence of suggestive therapeutics. Have the patient fix the mind on the accomplishment of the desired object for a definite time at a certain time each day. This seemed to be a neurotic condition, no mechanical difficulty. This would illustrate the influence of mind over matter. There are cases where it is necessary for the patient to be careful of their diet. Some fruits have a salutary effect on the action of the bowels while others do not if used to excess. If you wish to use fruits acting somewhat as a laxative, grapes, apples and prunes are among the best. Figs are said to be good, but in many cases they act differently if any amount is taken. (Case where apples kept the bowels in fairly good condition. Explain.) Fruits such as strawberried, blackberri berries and raspberries have just the opposite effect. Oat-meal and whole wheat bread are very beneficial in their action, their roughness producing a stimulating effect on the bowel wall. They may be used to excess and cause a clogging of the bowel. Many people do not drink a sufficient amount of water. It is better to prescribe a pint of water to be taken a half hour before breakfast than an enema. If taken then, it is thought to pass into the intestines and, being absorbed there, and carried by the portal circulation to the liver cause an increased flow of bile.

LECTURE 44 - 1.

Diarrhea, Dysentery and Flux: Diarrhea means to flow through. It consists of watery evacuations sometimes acrid. There is some abnormality existing between the processed of secretion and absorption. In health they balance each other. There is some cause at work which affects the nerves of the intestines and this then influences the blood supply. There may be cases where the amount of secretion is only normal and still have a condition of diarrhea. The irritation is sufficient to cause excessive peristalsis and the result is that the contents of the intestines are rushed through too quickly. Some osteopaths claim that there is always a spinal lesion as a first cause; that there is some abnormality of the spine in the lower part, either in the splanchnic area or the lumbar region. That this lesion is such as to affect the nervous mechanism of the intestines and cause the excessive peristaltic action; also the dilatation of the mesenteric vessels, which may cause inflamation, or at least abnormal glandular activity, leading to increased exudations, thus producing abnormal secretions. I cannot look at it just in that light. Not but that I admit that there are spinal lesions, yet I rather think that many such lesions are of secondary nature. The reason I make the above statement is this: Nearly all the exciting causes may act without there being any primary lesion along the spine. Then where diarrhea exists as the outcome of some other disease it is purely symptomatic. You might ask the question:"If the lesion is not along the spine can we hope to control the disease by treating the spine?" We may and do. If no primary lesion there, the diseased condition of the intestine, whatever the primary cause of the irritation, will cause contracture or other abnormal condition. Now you see what I meant when I said the spinal lesion was in many cases secondary.

Some osteopaths, among them Prof. Riggs, believe that in every case of chronic diarrhea there is a spinal lesion. Prof. Riggs agrees with what I said above, that the spinal lesion might not be primary. But the continuous irritation, protracted sometimes for years leads to contractures which may and do eventually become marked spinal lesions, even to the curving of the spine, misplacing of a vertebrae or forming a rigid one. I think this is not at all improbable, as in examination we find that such conditions exist as the result of a strian. I can not see why the continuous irritation may not lead to such results as well.

The second disease of which we are to speak is dysentery. By some it is called bloody flux. If so recognized we may speak of the two, dysentery and bloody flux, as one. Dysentery teymologically is, bad bowel. There is inflamation of the wall of the large intestine. The mucous lining is shed and extravasations of blood take place, hence the stools consist of bloody mucous. By some it is claimed that the true dysentery only occurs in malarial district and mostly in or near trophical regions. We know that the bloody flux is in our temperate region and the time is nearing when we will see its effects. Our idea in regard to these troubles is somewhat similar to that of diarrhea. That there may be some spinal lesion, or some exciting cause may operate so that we have an irritation or some morbid condition of the nervous system and this operates on the blood vessels as stated above. Our treatment is first on the spine then on the abdomen. It might be well to treat the vagus in the neck. Here we would give an inhibitory treatment, as this would quiet the motor impulses.

Now as to our treatment for diarrhea, especially the chronic form, along the spine, we may place the patient on the side and give a good thorough treatment. Give a strong pull and a long pull. I would not give so much of a stimulating treatment but would hold for asshort time at each place the hands were placed. Work down the entire splanchnic area, springing the spine strongly.

Place the patient on the back and treat the liver and spleen well. You might think that an increased flow of bile would necessarily make the condition worse. Yet Hare in his practical therapeutics says that this is not by any means the true status. Also that diarrhea may follow a lessened secretion of bile. If this be true then we would certainly want to stimulate the liver well. At any rate we cannot doubt but that the liver when working properly is a regulator of the bowels. By many it is said to best to give rather an inhibitory treatment to the liver by pressing strongly on the right side from the 8th to the 12th ribs. You can do this by pressing the thumb near the angles of the ribs. Yet our principal work there is to allay irritation by removing contractures. Our work on the abdomen is for the purpose of relaxing the tissues there, thus allaying nervous irritation and equalizing the blood stream. This may be accomplished by giving somewhat of a spreading motion over most of the abdomen and releasing all contractures. Sometimes I have the patient lie on the stomach and I give a short inhibitory treatment from the 10th dorsal to the 5th lumbar.

With bloody flux the disease is mostly in the colon, hence our treatment is mostly below the dorsal region. The principal treatment I give for it is to sit the patient on a stool, stand almost in front of the patient, reaching around them and bringing steady pressure against the lumbar nerves while breaking the spine backward, that is, beinding it backward at the same time. Miss. Thoburn tells me of a case of cramps where the inhibitory treatment along the spine did not allay the trouble. By the osteopath giving an inhibitory treatment on the front of the abdominal wall, that is by steady pressure over the large sympathetic plexuses the treatment was successful. It is said that we may allay tenesmus by treating and working over the sacrum, to give a stimulating treatment. This is one I have never had occasion to use and can only give it to you to try. (Stopping gripes.))Case of Chronic Diarrhea, Mr.Seigmual.)

The pelvis: This is formed by the sacrum, coccyx, and the innominate bones. You can feel the sympbisis pubis, the pubic spine and trace the crest of the ilium. By passing backward on the crest of the ilium we come to the posterior superior spines of the ilium. Horizintally these are nearly on a level with the second sacral spine, which is about the middle of the sacro-illiac synchrondosis. (Holden). The third sacral spine marks the level to which the membranes of the cord and cerebro spinal fluid descend The tuberositus of the ischia are covered by the Glutens Maximus when standing, and only by a pad of carse fat when sitting.

The fold of the buttock is near the lower border of the glutens maximus, Treves says just above. This is a transverse fold in the erect posture. When the hip is flexed the buttock becomes flattened, the gluteal fold becomes oblique or entirely disappears. One of the early symptoms of hip disease is the flattening of the buttock and loss of the gluteal fold. Holden says this due to the muscular atrophy. Treves says this symptom is dependant upon the

flexion of the hip, which is nearly always present before beginning treatment. These symptoms are exaggerated by the muscular atrophy but this occurs later in the course of the hip affection. Draw a line from the posterior superior spine of the ilium to the trochanter major, the top when it is rotated inward. The junction of the upper with the middle third of this line marks the exit of the gluteal artery from the pelvis and marks the upper border of the great sciatic notch. The pudic artery and nerve emerges from the pelvis and passes over the spine of the ischium to reenter the pelvis. If the spine is hard to find, draw a line from the posterior superior spine of ilium to outer side of the tuberosity of the ischium. The junction of the lower with the middle third gives the position of the artery and nerve. (Hard as against soft seats.) If we wish to get the course of the great sciatic nerve draw a line from the same point the others were drawn down the back of the limb so as to lie between the great trochanter and tuberosity of the ischium rather nearer the ischium. Here would be a place for us to exert pressure on this nerve. The lower outlet of the pelvis is called the perineum. This has an osseous and ligamentous boundary as follows: The rami of the pubes and ischia, tuberosities of the ischia, the great sacro-sciatic ligaments and the tip of the coccyx. If a line was drawn from one tuberosity to the other, this space would be divided into two triangles. In the female that part on front of this line is called the true perineum. In women it is well to note the condition of the perineum. These muscles and ligaments normally form an adequate support for the internal organs and in order to do so there is a slight bulging upward of the tissues. This bulging is slight but important. If there is a sagging of the perineum, it shows that there is a relaxation of the muscles and a loss of tone to the ligaments, permitting a dropping of the pelvic contents.

Now an examination of the pelvis is now inorder. Its position first, and in that connection I want you to note the dog-ear shape of the sacro-iliac synchondrosis and that the sacrum is broader in front than behind. One of the first points in examination is to note if any soreness exists in the sacro-iliac ligaments. If so, then tension is existing on these ligaments and we must determine if both innominate bones are pushed bachward, forward or twisted. If the tenderness is one sided then the lesion is on the affected side. The pelvis as a whole may be slipped either forward or backward. These slips is whatever way are handled successfully.

43 A point to be noted in our examination of the pelvis is the condition of the symphisis pubis. There will be tenderness here if one of the innominate bones be moved as this will put a strain on the ligaments there. Again where the sacrum seems to have thrown the innominate bones further apart because of its wedge shape there is a strain brought on the ligaments of the symphisis, hence the tenderness. We see readily that the soreness or tenderness spoken of at the sacro-iliac articulations is dependent on some twist of the pelvis, or of one or both of the bones being misplaced or twisted. This will bring a tension on the ligaments of the articulation. If the pelvis seemed to be turned laterally the same effect would be produced, that is, the soreness would be found to accompany the tension.

To detect the tilting of the pelvis note the position of the iliac spines, both anterior and posterior, to see if there is a lateral tilting, put the patient on back, note if they are lying perfectly straight, if so, then see if a line connecting the two anterior superior spines is at a right angle to a line drawn parallel to the middle line of the body. If one or both innominates are twisted they are sure to cause or be the source of irritation to the sacral plexus of nerves, and in this way we may have pain in the sacrum, hip, sciatic nerve or the knee.

41 Treatment: First as to a sagging perineum. This is done by treating two nerves or sets of nerves from some misplacement. (unles If some misplacement it must be remedied. Then treat the pudic nerve; this supplies the tissues of the parts . It is easily reached where it passes over the spine of the ischium. Then again the levator ani and cocygeus muscles help to hold up the pelvic contents and lack of nervous force to these muscles cause a lack of tone and consequently a sagging of the perineum. Their nerve supply is the 4th and 5th sacral, and our treatment must be applied to these points as well.

To relax the sacro-iliac ligaments also ilio-lumbar I have found that one of the best ways is to place the patient on the side on the table. You then flex the knee on the abdomen, reach over and grasp them just by the side of the spines of the last lumbar vertebrae and pull toward you. To the sacral articulation this may be helped by catching the iliac bone and pulling forward. Again lay the patient on the back, flex the leg on the abdomen while one hand is placed under the innominate bone pulling it toward you or upward. In both these treatments the work must be done first on one side then the other. If the pelvis is tilted forward you may have the patient sitting on the stool, place the knee on the sacrum and pull backward by grasping the anterior superior spines. This is generally sufficient to pull the parts to their proper position. Many times I have thepatient on the table and place the knee in the sacrum, pulling backward on the anterior spine. If one bone of the pelvis is twisted I generally get the patient on one side, stand behind them and gasp the anterior superior spine with one hand and the tuberosity of the ischium with the other and twist it to suit the case. Sometimes one innominate may be pushed upward and tilted. Then you must get an assistant or strap the patient to the table. Grasp the innominate bone as stated above, only you may find it best and most convenient to stand in front of the patient. Sometimes we have a shortening of the leg from the cause just mentioned and the difficulty

with the leg disappears when the innominate is righted. There is this that you find, any difficulty with the bones of the pelvis is apt to be a source of irritation to the sacral nerves and a fruitful source of female troubles. Also all muscles of this area must be relaxed, among them the quadratus lumborum is one of the most important. You are aware of the method used to stretch it.

We will note some of the nervous connections in the pelvis. The American Text Book of Physiology says that we get vaso-motor nerves to the external generative organs from two sources, as follows; from the lumbar part of the cord and the sacral group. They pass out from the anterior roots of the 2nd, 3rd, 4th and 5th lumbar nerves and go by way of the white rami-communicantes to the sympathetic chain. They reach their distributions mostly through the pudic nerves. None of the fibers from this lumbar group enter the nervi erigentes. Stimulation of these nerves causes constriction of the blood vessels of the external genitals. The sacral group of nerves compose the nervi erigintes, they leave the spinal cord in the 2nd,3rd and 4th sacral nerves. Stimulation of these fibers cause a dilatation of the external genitals Now as to the internal generative organs, the fallopian tubes, uterus and vagina in the female, the vaso-deferentia and vesiculae seminales in the male. These receive vaso-constrictor fibers from the 2nd,3rd,4th and 5th lumbar nerves. This is the same origin as the vaso-constrictor fibers for the external genitals. This shows us that the pudic nerve is of extereme importance to us. Also the fact that the nerve control of the genitals is from the lumbar and sacral regions. Of the pelvic viscera we will deal first with the bladder and the prostate gland. In a previous lecture was cited the shape and position of the bladder in various conditions. If a catheter has to be introduced in the examination it should be sterilized and made aseptic, as the promiscuous use of such instruments are productive of much trouble. In your studies in urinalysis you will be made familiar with some of the ways that you may be able to locate the trouble, whether in kidneys,ureters, bladder or urethra. The bladder has a double nerve supply but not such an one as is generally given. One is from the lumbar nerves passing out from the 2nd to the 5th. Stimulation of these fibers causes feeble contractions of the bladder. We note that these fibers have the same origin as the vaso-motor fibers to the external genitals. No vaso-motor fibers are as yet discovered as passing to the bladder through the lumbar or sacral nerves. The second set of fibers to the bladder is from the sacral nerves, the first four, the best results are obtained through the second and third. Stimulation of these fibers produce sufficiently strong contractions to empty the bladder. From the foregoing it is seen that stimulation in either the lumbar or sacral region will cause contraction of the muscular walls of the bladder. And if we wish to quiet spasm of the bladder wall we must inhibit the nerves passing from these parts. Although we find that the sacral nerves are the ones that seem to have the most control of the bladder wall, according to the experiments of Goltz, the spinal center through which the reflexes take place is in the lumbar part of the cord between the 2nd and 5th. There is a very close relation between the anal region and the neck of the bladder. We find that the base and the neck of the bladder are controlled by the 3rd anf fourth sacral. Hence painful affections

of the rectum may cause bladder troubles. After operation for piles there may be retention of urine, this may cause the muscular tissue to become too contracted and in this way prevent the flow of urine and lead to hypertrophy of the bladder wall. Again bladder troubles may be associated with tenesmus and anal discomfort. The cause of this is that disease at the base or neck of the bladder is a constant source of irritation to the sacral nerves hence the tenesmus and anal discomfort. There is one other point I wish to mention here, that is the close connection of the spermatic plexus and the renal plexus, also its connection with the solar plexus. Of what significance to us? In certain affections of the kidney (acute nephritis, also passage of renal calculi) there is pain felt in the testicle and retraction of that region. Again in sudden injuries to the testicle there is generally great collapse noticed and a marked tendency to vomit. How are these to be explained. First, the spermatic plexus starts or is mainly from the renal plexus, hence the effect on one organ showing in the other bacause of this intercommunication. Second, by means of the renal plexus the spermatic has a very direct connection with the solar plesus. (Note injury to intestine.)

The treatment for the bladder has been outlined in giving the action of the nerves when stating their origin. If we wish to stimulate the action of the bladder, we must stimulate mboth in the lumbar and sacral region. If to inhibit the action of the bladder we must inhibit the nerves here. I find that in stricture an inhibitory treatment in the sacral region seems to be quite beneficial. It is necessary sometimes to treat deeply in the pelvis to reach the iliac circulation, as they supply the blood supply to the bladder. Then you can reach down deep in the pelvis and draw upward on the tissues. This is beneficial. There is one treatment given for the uterus and ovaries which is beneficial to the bladder as well, that is, to have the patient on the back on the table with the limbs flexed on the pelvis. Let the patient hold the knee firmly together while you pull them apart, then you exert considerable force to hold them apart while they draw the knees together. This seems to increase the tone of the pelvic organs. You know the position of the prostate gland as the first portion of the urethra passes through it. (One and three-fourths inches). From some irritation this gland may become enlarged and be the cause of retention of urine, as the middle lobe may give rise to a flap that almost stops the urethral passage. The more strain the more completely the passage is closed. It is found that after middle age three-fourth of the males have enlarged prostate. Many times in affactions of the prostrate pain may be felt over the perineum, puttock and sometimes down the thigh.. We find these parts are closely connected by means of the pudic and small sciatic nerves. The very spinal nerves that send out branches to join the plexus for the viscera give origin to the pudic and small sciatic. The first from the 3rd and 4th, the second from the second and third sacral. Thus the pelvic viscera, and the skin of the buttock, perineum and external genitals are closely associated by these same spinal nerves. The treatment of the prostate gland would be through the nerves principally. It may be necessary to examine the prostate and treat it locally through the rectum. One must be familiar with the normal then we recognize the abnormal readily.

The Ovaries, Fallopian Tubes and Uterus: In speaking of diseases of these organs and the treatment of them, (female diseases is one field in which the Osteopath has had unequalled success.

Fashion and habits of life in this age are conducive to such troubles. If we are able in to-day's lecture to throw any light on the control of these organs, our work is accomplished. The position, and examination of these organs properly belong to the Gynecological and Obstetrical departments. (Mrs. Still's) and I do not wish to encroach, as an abler hand points out the abnormalities It is necessary to give somewhat of the location as well as examination of the organs in question for the purpose of understanding our theory.

The exact location of the ovaries is somewhat hard to be given. Their location is dependent upon the position of the uterus As a rule they are about two inches inward from the anterior superior spine. When in a normal condition it is hard to feel them. Inspection of the abdominal wall, palpation and examination internally, (locally) are the methods we use in examination of these organs. When there is any enlargement from a tumor, congestion or swelling of any kind we are able to locate them readily by the tenderness, and if tumor is of any size, by enlargement on the abdominal wall. Palpation easily locates the growth. The overies are closely connected with menstruation. When they are removed menstruation disappears. It has been said by some that the ovaries alternate in their ovulation and that such a point would be used to locate the one that was diseased if disease existed. I find no authority for such a statement and think it is not reliable. There are cases where menstruation has been stopped from obesity. This was accounted for as follows. The excess of fat pressed upon the ovaries and cut off their blood supply, this lead to their atrophy. It also may separate the lobe and ovary so that the tubes do not catch the ovum when discharged. In this case we may have menstrual troubles dependent upon obesity. Note also that the ovaries are situated in the broad ligaments uterus. If the uterus is prolapsed then the ovaries are drawn downward and constitute a very prolific source of trouble. It is necessary to say but very little in regard to the fallopian tubes. You know their origin from the uterus, their extension so that the fimbriated extremities are close enough to the ovary to grasp the ovum when discharged. Their muscular coats are supplied by nerves which we will give when speaking of those of the ovaries and uterus. We will now give a few points as regards the position of the uterus normally and abnormally, also our method of examining before considering the theory of our work. You are familiar with the position, normally it is tilted forward at the upper part of the vagina so as to form an obtuse angle, some give it as nearly a right angle. Full ness of bladder changes the position. It is not above the brim of the pelvis nor quite in the median line, to left three to one. We have frequent misplacements. These act as irritants to nerve centers and plexuses. Pressure on other pelvic viscera results in serious trouble as well as the dissemination to different organs of impulses originated by the irritation to the many pelvic nerves..

There may be a prolapsus, This will cause a bearing down feeling, a dragging on the ligaments that hold it up. This and some other misplacements result in vomiting, from gastric irrita-

tion, also in headaches. These headaches are generally localized though not always in the same areas with all persons. There are three points generally noticed in the top of the head, 2nd, back of the head, 3rd, on the forehead rather to one side.

We have yet four other misplacements, those anteriorly called ante version or when bent on itself, anteflexion. This is one cause of frequent micturition from the pressure on the bladder. Backward tiltings are called retroversion and retroflexion. This is likely to be the cause of constipation, dragging pain in the loins as well as pains in the lower limbs. I think we have had an explanation of the pain found in the hips and limbs, in that the misplaced organ is a cause of nervous irritation to the sacral plexus and these reflect impulses to their peripheral distributions. We also know that misplacements are causes of many menstrual troubles and lenkorrhea. The lenkorrhea is where the nutrition of the wall of the uterus is partly cut off, the circulation is impeded and causes a morbid secretion, the discharge. Just one word as to examinations. I intend to give only as much as may be necessary to understand the treatments. You may place the patient on the right side or on the back on the table. You may be able to locate the organ by introducing the index finger, or better the index and middle fingers of the right hand, oiling them with vaselin or lard before introducing. Use the left hand on the lower abdominal wall, this will help to get the condition of the organs. In this way we are able to detect any enlargement from tumors or within physiological limits. It is said that a healthy os has the feeling of the cartilage on the end of the nose, a very good description. You must here remember the angle, and that it is variable, at which the vagina and uterus meet. To detect if the uterus is twisted, the transverse slit of the os in its position to the lines of the body. There is yet another way of examinations: The index finger introduced into the rectum and the thumb in the vagina In this manner the uterus may even be grasped by the thumb and finger of the operator and moved to suit. These are just as good for treatment as examination.

The digital examination of the rectum acquaints us with the condition there, as such a condition may exist as to be a constant source of irritation to the nerves and in this way cause uterine trouble. Slips, twists and tilting of the pelvic bones act similarly as a source of irritation to the pelvic nerves, consequently affecting pelvic organs. There are times when lack of tone to the vaginal walls there is a prolapsed and flaccid condition existing This is conducive to prolapsus of uterus as the vaginal walls are one means of support to this organ. Lenkorrhea is klikely to accompany such lesions.

Let us now note the origin of the nerves and the influence thy extert, as this presents the key to our work. One author states that the nerve supply of the uterus and ovaries is the ovarian and pelvic plexuses and branches from the third and fourth sacral nerves. Other authorities corroborate this statement, saying that the inferior hypogastric nerves supply the uterus. They are identical with the pelvic plexus. The ovarian plexus springs from the renal plexus with the help of the aortic. The renal plexus gets

its principal nerve supply from the smaller or renal splanchnics which has its origin from the 12th or 11th and 12th sympathetic ganglia. These sympathetic ganglia are closely connected with the cerebro-spinal nerves, 11th and 12th dorsal. and furnish us one of the pathways for our work.

The pelvic plexus sends fibers to the uterus from the hypogastric plexus which is formed from the aortic plexus, fibers from the lumbar ganglia and lumbar spinal nerves. Here we are in communication with cerebro-spinal nerves of another region, another pathway for our work

Then the last set of nerves to the uterus are from the sacral region, 3rd and 4th. These are the pelvic splanchnics of Gaskell and the fibers pass directly to the pelvic plexus without the intervention of intermediate ganglia. There are likely some fibers from the sacral sympathetic ganglia to the uterine plexus, thus forming a double connection with the sacral spinal nerves. Here again is a third pathway for our work.

The vaso-motors, the vaso-constrictors for both internal and external genitals are from the ~~sacral~~ lumbar region. The clitoris and has a nerve supply similar to the lower part of the uterus, while the round ligaments have the same nerve supply as the main body of the uterus. By some authorities it is considered that the sympathetic nerves mainly supply the longitudinal fibers of the uterus, while the spinal nerves supply the circular fibers of this organ. This is yet an unsettled question. Let us see what effect we are likely to get from the different pathways mentioned above. The first one mentioned was the 11th and 12th dorsal by way of the ovarian plexus. Stimulation here is bound to affect the ovaries, mainly ~~he~~ nutrition by the effects obtained on the uterine artery. It may also increase the peristaltic action of the tissues it supplies. We know that in practice a lesion here which seems to shut off nerve supplies has the effect of disturbing menstruation, in fact any lesion. The second pathway is from the lumbar region. Here is where by stimulation we can lessen the blood supply to the uterus and appendages. It has the effect of causing contractions of the uterus. At the second lumbar is located the parturition center, and we know that stimulation here does bring on the uterine contractions although the impulses pass through the sympathetic centers and become rhythmic. If we give an inhibitory treatment along the lumbar region the effect is opposite to that mentioned above. We allay uterine contractions and thus prevent abortions unless the foetal membranes are torn loose from the uterine wall. It also has the effect of lessening vaso-constrictor effects on the blood vessels of this area. The third pathway given is the sacral region. If stimulation is given there we are likely to cause contractions of the circular fibers of the uterus and a tumefaction of the external genitals. If an inhibitory treatment is given we quiet the action of the circular fibers of the uterus and at the beginning of labor it is very necessary in order to help in the dilatation of the cervix.

We have yet the round ligaments and the Clitories as adjuvants By inhibiting on the clitoris we can ease pain in the uterus and its appendages. Painful sensation, irritation of sensory nerves here generally cause contractions through the spinal centers. So here it causes contractures and by the inhibition of the sensory impulses we may really cause a dilatation of the cervical fibers

reflexly. The round ligaments, by an inhibitory treatment, we are able to cause a cessation of motor impulses and hence a dilatation of the organ. Also as this connects with the nerves carrying vaso-constrictor impulses it is not only possible but very probable that by an inhibitory treatment on the round ligaments we are able to allay constrictor impulses and indirectly cause a dilatation of the vessels of this area. These are points of importance to us in treatment of irregularities of mensturation, whenever necessary to dilate the parts, allay pain, or regulate the blood supply.. We know the parts of the body that seem to be mostly under the control of the sympathetic system are rhythmatic in their action. The viscera are examples. Then we reason that any irritation to these nerves disturbs the rhythm and disease or disorder is the result. Let us see how this idea corresponds to or agrees with the best theory of menstruation given. Here is Pfluger's hypothesis. The constant growth of the ovarian cells and the consequent swelling of the ovary subject the ovariannerve fibers, and through them the spinal cord to a constant slight stimulation. To the summation of stimuli within the cord, a reflex dilatation of the vessels of the genital organs is produced. The excessive blood supply leads to tumefaction of the uterus and may be the ripening of a Graafian follicile. Bleeding (menstruation) follows, and at the same time or later the rupture of a follicla occurs." This would seem to indicate that the summation of stimuli is only sufficient in quantity that it requires 28 or 30 days to reach the necessary tumefaction for the menstruation. Here is where we may cite the "American Text Book of Physiology," as saying that menstruation and ovulation are two phenomena which may not occur at the same time. Yet according to Pfluger's theory if no ovulation, then no menstruation. This shows that the constant stimuli seem necessary to cause the uterine congestion. If from any cause these stimuli are increased, decreased or entirely cut off there would be disturbance of the rhythm of this part of the body and hence menstrual difficulties. By means of the forces given we are able to regulate these stimuli and this will establish a normal rhythm. It must be understood that all mechanical difficulties must be removed and other causes of irritation and inhibition.

One other pathway must be mentioned, the pudic nerve. You remember it contains vaso-constrictor fibers for both the internal and external genitals. Thus you see in lenkorrhea where the circulation is especially at fault, the pudic nerve is of great importance to us. Stimulation will give tone to the vessel walls. It will do more than this, it supplies cutaneous filaments to the external genitals and motor filaments to most of the muscles of this area. Through the branches to the accelerator urinae (sphincter vaginae, levator ami, etc.) the normal tone of the vagina is established. Remember the branch to the mucous membrane of the urethra. While the branch to the clitons is very likely the one through which we obtain the results by inhibition of clitons mentioned previously in this lecture. We will take up the treatment proper at the next lecture.

LECTURE 47 - 1

TREATMENT OF INTERNAL GENITALS.

The Ovaries: In most cases of ovarian trouble it is well to treat from the 9th to 12th dorsal. At our last lecture we gave the reason why. If we wish to get an effect on the ovarian plexus we would treat anteriorly, the patient lying on the back, get up under the transverse colon as far as can be done easily, if possible to the height of the ovarian artery and spread the tissues, working downward toward the ovary. This seems to aid the blood supply of this organ. Then also as a stimulus to the venous supply press the tissues upward. We must work on the pelvic plexus and work in the lumbar region, 2nd lumbar and 5th lumbar also, as the last named place reaches the hypogastric plexus readily.

It seems that a treatment, a spreading and working of the tissues toward the uterus affects the circulation of the part as well as to release all contractures of this area. Relax the ligament at the sacro-iliac articulation. Mrs.Still tells me that some stubborn cases of disease of the internal genitals have yielded to treatment on the pudic nerves. (Give its origin and what vaso-motors it contains.)

The uterus: Any slip or twist of the pelvis must be remedied as soon as possible. I have shown you how to replace all such twists and how we may take tension off the ligaments and thus remove any existing tenderness.

The manner of examining the uterus wasggiven, if any malposition, it must be remedied. Generally you are able to replace by putting the patient in the same position as you had them for examination, using the index finger in the rectum, and thumb in vagina. If tilted backward very badly it may be better for the patient to assume the genn-pectoral (knee chest) position, or knee elbow, in either of these positions gravity assists you. (Case of drawing and jerking themselves in this position).

You must remember this, in replacement of either the uterus or the prolapsed rectum, they will not keep their position unless we treat the spine, stimulating the nerve force and regulating the blood supply of the parts. Especially is this true of prolapsus of the uterus. In this last condition it is well to note the condition of the vaginal wall, by treating it locally to smooth out the wall and thus stimulate the blood and nerve force of the passage. You remember it is one of the supports to the uterus.

Our treatment of lenkorrhea consists in righting any mechanical trouble. Then we treat the lumbar region from the 2nd to the 5th; this for the purpose of regulating the blood supply and strengthening the tone to the musculature of the uterus. The pudic nerve contains the vaso-constrictor fibers and supplies muscles of the perneum and vagina and the best of results are obtained by treating this nerve.. (Case where plugs of mucous as large as thumb-nail are discharged). (Warning about treating locally very often).9Knee on Sacrum). Raising the viscera by treatment above the pubis for prolapsus; also effect of tension on the parts by drawing the knees forcibly and the patient moving them back to gether.

Difficulties of menstruation: Find if any misplacement is aggravating the difficulty, if so remove it by righting it. Then for amenorrhea we must treat the 11th and 12th dorsal, second ~~and~~ to 5th lumbar and the pudic nerves. It is said by some that a lesion of the 11th dorsal is sure to cause menstrual trouble. This con-

Subinvolution

nects with the ovarian plexus and very likely is true. It may be possible there is a bloodless condition of the system. If so, the general condition must be helped first. A good move to stimulate nerve force and increase the blood supply, is to lay the patient on the face and give a twisting, turning, figure of eight move to the dorsal or lumbar region. (Good relaxing treatment).

In dysmenorrhea or menolipsis inhibition of the round ligaments is very beneficial.(dilatation of os). For dysmenorrhea an inhibitory treatment on the clitons will ease the pain. Sometimes treatment at the 5th lumbar or inhibit the great plexuses of the abdomen is very beneficial. It is generally best not to treat uterine centers alone but to look for predisposing causes elsewhere and to remendy that. Also note the condition of the sacro-iliac synchondrosis. (Caution about inhibition of round ligaments causing memorrhagia). The special treatment for menolipsis is said to be an inhibitory treatment to the entire splanchnic area, the 11th dorsal in particular. This seems to inhibit constrictor impulses starting from that area. Reach around the body with fingers on eah side of the lumbar spines. Bend the spine gently backward, giving it a lateral rotary motion. Work the ovaries and tubes as deeply as possible into the pelvis, pulling them upward and to the median line. It is said to be well to treat the pyriformis muscles in cases of lenkorrhea, inserting the finger and spreading or pressing the fibers of the muscle. I think the effects obtained here are through the pudic nerve. 45 In cases of flooding at the menopanse, post partum hemorrhage, or flooding at other times. The predisposing conditions must be removed, all the functions of the body should be made normal. The treatment to allay the condition is as follows: Give a quick jerk of the mons veneris, this stimulates these nerves sufficient to cause the necessary contracture. I have known some persons to put a piece of ice there suddenly; it seemed to shock the nerves and bring about the desired effect. Put the knee on the sacrum, grasp the anterior superior spines and pull backward. In many cases this causes sufficient contracture. You remember the nervous pathways, through which it was possible for impulses to travel from the mamma to the uterus. A stimulation of the nipple is sometimes sufficient, while a quick slap with the flat of the hand or a wet towel on the breast or nipple may be necessary. After labor do not give these treatments unless you are sure there is no partial retention of the placenta, but one of true post-partum hemorrhage. We see from the above our work depends on the stimulus to the motor nerves over the sacrum or a stimulation of the sensory nerves of the mons veneris which reflexly affects the motor nerves to the body of the uterus and causes a closing of uterine sinuses. An inhibitory treatment along the spine is to be given if threatened miscarriage. In pregnant women I think it not permissible to give strong treatments at the 11th dorsal and 2nd ~~to~~ 5th lumbar. I think though sufficiently strong treatments can be given to accomplish the results desired in most diseases without bringing on contractions of the gravid uterus.

The Lymphatics: There are small capillary spaces all over the body for the purpose of bringing the rich blood supply in immediate contact with the tissues and collect the waste products of metabolism. These small tissuesspaces open into definits lymphatic

vessels. These small vessels unite with others until they all converge to the right lymphatic duct and the thoracic duct. Those of the intestines are called lacteals. The lymphatic glands or ganglia interest us as much as the lymph stream. There is an enlargement of these glands in different parts of the body caused by various septic conditions. The name absobents is given to them because of the property they possess of absorbing certain materials and conveying them to the circulation. The cause of the enlargement of the glands is from some retardation of a part of the contents of the lymph stream. Absorption of the substances from poisoned wounds or some diseased condition of the body is carried to the galnd. The reticulum of the gland retardsthe passage of the lymph stream and the elements of the stream are easily arrested and deposited in the sinuses of the gland. Unless from some mechanical stoppage the enlargement or swelling of the lymphatic glands tell us that some septic process is taking place, that the part of the body which these particular glands drain, is diseased. This you see is helpful in locating the disorder for the purpose of specializing our treatment. The enlarging of the glands is a protection to the remainder of the body as preventing the carrying of septic, poisonous substances directly to the blood stream. It is known that these glands give rise to cells which I suppose we are safe in calling leucocytes. It is thought such cells have the power of protecting the body from pathogenic bacteria. (How). From the above we see that our work is to treat the cause of the disease instead of putting very much work directly on the glands. This is especially true in acute disorders. The glands may become the normal size some time after the septic process is stopped. The lymphatic system itself may become diseased. Hence, in order to help the return to normal of enlarged glands, and overcoming of diseased conditions, it is necessary for the control of the lymphatics to be known if possible. There are generally three causes given producing the flow of the lymph, as follows, first visatergo, the pressure under which the lymph passes into the pymph spaces. 2nd, contractions of the muscles and the pressure of valves in the vessels to prevent a return flow. 3rd, respiration hastens it. At every inspiration the pressure is negative in the great veins near the heart, and lymph is sucked into them. Then the pymphatic vessels have nonstricted muscular tissue in their walls. Byron Robinson declares they are innervated as surely as the arteries and veins. In the abdomen the splanchnics control the lymphatics to a great extent. Stimulation of the splanchnics acts on the thoracic duct similarly as on theother blood vessels. It seems very probable that effects may be obtained by or through the cervical and upper dorsal nerves. Stewart in his physiology says that passive movements of the limbs hasten a sluggish lymph current and that it is sometimes used to treat disease. This effect may be of a two fold nature, the mechanical effect of the movement of the muscles, and then the influence on sensory nerves, which reflexly affects the pymph channels through the lymphatic vaso-motors

LECTURE 48 - 1

At our last lecture we stated that in the vent of enlarged glands it was best to treat the original cause. We may have enlarged glands in the neck from chronic sore throat, tonsillitis or diphtheria, sometimes from measles. The glands of the axilla, groin and other parts of the body may enlarge. Those of the groin include two sets. One on about a level with Poupart's ligament. If these are enlarged there is some disease of the pelvic organs or the genital organs. If the set near the saphenous opening is enlarged, the diseased condition is very likely existing in the lower limbs, as these drain the lymph from that part of the body. Any condition affecting the general nutrition of the body is very likely to affecy the lymphatic glands and vice-versa. Our treatment then consists in first ridding the system of the diseased condition, measles, etc. Where the general nutrition of the body is affected we would want to treat the heart, the lungs, the liver, the bowels and the kidneys. This you see the includes the alimentary tract and all the excretory organs. In giving special treatment to the glands we could control the thoracic duct through the splanchnics and upper sympathetics.

We would find if the clavicle was down, raise it and take the pressure off the thoracic duct and subclavian vein. The first rib must be looked after as it is likely to cause the same trouble and a tightening of the tissues around this area which must be removed. the three forces I mentioned at our last lecture are at work at all times, hence it may be well to stimulate the heart's action, making the vis-a-tergo stronger. Then as muscular exercise is very beneficial we would orceed to give passive mevements to the limbs, as Stewart says this hastens the lymph flow. I will show you how to give these when speaking of the limbs in the latter part of the lecture. There is a theory about the lymphatics and obesity that weget while in school which I think has not been successfully demonstrated. You may experiment the same as others. There is a fleshy cushion at about the 7th cervical with most persons that are obese. This cushion and the thoracic duct are somehow connected and also with this condition. By a removal of this fatty cushion the patient is relieved; the same treatment gets rid of the excess of flesh. It is claimed by some there is a center for nutrition at the 4th dorsal. The treatment consists in treating at this nutritional center and in the cervical region, also to give an alternate stimulating and inhibiting treatment alnog the transverse processes of this area. This seems to have the desired effect, coupled with the control exerted over the origin of the thoracic duct by the splanchnics.

The Extremities: There are a great many things to be said about the limbs; there is not so much of it within the province of this lecture. There are a few things which I am satisfied you would wish to know and I will speak of some of them.

The Lower Limbs: You wish to become familiar with some irregularities of the hip joint. I am going to give the dislocations there according to Treves. 1st. On dorsum ilii the head is above the acetabulum and may be slightly behind it. In this we have the leg shortened and the toes turned inward. 2nd, dislocated backward and the head in the sciatic notch, at least rests upon ischium near the ischial spine. In this also the toes are turned inward and the leg shortened. By feeling for the great trochanter

we are able to tell these two dislocations apart.

3rd. Forward and downward with the head resting on the thymoid foramen, it is called the obturator or thyroid lislocation? Here the knee is bent, the toe drags, points to ground and may point either outward or inward.

4th. Forward and upward, the head resting upon the pubes. In this the toes are turned outward and the limb shortened. I will give you a general idea as to how to replace these dislocations. Your surgery will make it plainer.

In the dislocations on the dorsum ilii and sciatic notch, the movements are similar. We would relax the Y ligament by flexing and adducing the limb; then to bring the head of the bone into the capsule where it went out we would circumduct outward, and then to cause it to enter the acetabulum we must follow these moves with extension. In the thyroid and public dislocations the thigh is flexed when the limb is abducted to relax the Y ligament, then we circumduct it inward to get the head in the capsule, this to be followed by extension to get head in the acetabulum. Note this- The internal condyle of the femer faces in nearly the same direction as the head, and this is a point we can use to advantage in dislocations. Hip troubles are the one thing which are both exasperating and pleasing to the osteopath. There are some cases which are readily set and the osteopathic reputation is [illegible]made There are other cases which take all the skill and ingenuity of the most skillful and then may not be successful.

The location of the femoral and saphenous openings and how to relax the structures about these parts: We may locate the passage of the femoral artery by feeling the pulsation of the artery under Poupart's ligament. If we wished to find the femoral ring we would allow a half inch to the inner side of the artery for the femoral vein and then we have reached the femoral ring. The saphenous opening is sometimes located by means of a slight depression on the integument of the groin. It is below poupart's ligament and is about one inch and a half below and externale to the spine of the pubes. For taxis of a hernia or to relax the structures about the saphenous opening, the thigh must ne flexed and slightly rotated inward. This will allow these parts to be manipulated to the best advantage and stretch the structures about the opening.

The disease, milk leg or phlegmasia dolens, is many times caused by a partial misplacement of the hip and stoppage of these openings. See to the hip and relax structures around opening. Sometimes the pyriformis may aggravate the difficulty; flex and rotate the limb inward and in this way stretch the muscle. We may now note how we can stretch a few of the muscles of the limbs and stimulate the lymph flow. By flexing and rotating the leg inward we stretch the external rotator of the thigh. By extending the leg and drawing it outward or away from the other we affect the adductors. Then you must stretch the anterior femoral muscles. Note that is stretching muscles we must lengthen the distance between the insertions, hence any move that does this accomplished the desired result. This anterior stretch also gets an effect on the femoral artery, the accompanying veins and the anterior crural nerve. I have shown you previously how to stretch the sciatic nerve; such a move will also stretch the hamstring muscles and those at the back of the thigh, but you must not let the leg bend at the knee. In speaking of anterior muscles of the limb, I forgot

to mention that it is helpful to exert steady pressure on the anterior crural nerve in Scarpa's triangle to cause a relaxation on the front of the thigh.

At the knee we may have four dislocations, forward, backward, internal or external. It is best to have someone help with counter extension, then according to the misplacement you would regulate the move. (Explain).

In rheumatism and lymphatic troubles the back of this joint must be worked properly. You may bend it over your own knee and work the tissues well, stretch the hamstring muscles outward, kneading the contents of the space well.

At the ankle we may have any of four different dislocations. We are able to distinguish by the position of the bones. Extension and a bending of the foot toward the misplacement of the bone. Pull the toe straight down, this will stretch the muscles of the anterior part of the leg and work up the joint well. By flexing the foot on the leg will stretch the calf muscles and have a like effect on the joint. Any misplacement of the toe is reduced by simple extension. Besides loosening the ligaments at the ankle we can also do the same in the foot by working the same back and forth from side to side and tryingto increase the arch of the foot and getting a spring to the tissues of the part. There is a rotary motion of the foot and ankle that is very beneficial. All of the treatments given above, where we get a movement of the muscles, is sure to affact both the nerve and the lymph stream.

The upper limbs: The shoulder joint may be thrown down into the axilla, backward under the spine of the scapula, or forward to the clavicle. There are two partial misplacements up against the acromion or inward against the coracoid process. Sometimes a straight pull with the knee on the foot in the axilla has the desired effect. If not, satisfy yourself of the dislocation, note the muscles that you can use, then move the arm accordingly. There is a catch in the shoulder joint at times, in which there seems to be a slip of the head of the humerus. This causes the bone to catch on the acromion so that the arm cannot be raised. I raise the arm upward toward the side of the head, then downward and outward, pressing at the articulation. (Miss.W.) Length of time.

There may be a contraction of the long head of the biceps; this may cause considerable pain. You know how it passes through the biceptal groove; then extension is all that is necessary to relieve this condition. The elbow is a joint that may be dislocated in several different ways, which I will not dwell on here, you will get that in surgery.

You know the course of the axillary and brachial arteries and by the extension of the arm we may stretch the tissues about them and affect the caliber of the vessels. The lymph stream is quickened. We may also release pressure on the nerves which is sometimes found to exist. In rheumatism the shoulder joints need to be worked up well. You may put the closed hand in the joint, work and move the arm over and around it. The elbow joint is also a place where deposits are likely to be found. Get a spreading of the tissues here by extreme extension, then you may put the knee in the joint and pull and draw down over the knee. Work the muscles apart also.

We come to the wrist and the small bones of the hand. These when misplaced are reduced by strong traction. In the small joints of the hand these deposits may first appear; if so, you must work to separate the bones of the hand.

LECTURE 49 - 1.

A part of this lecture will be devoted to a correction of at least two points which have been given in previous lectures. The first one will be found in lecture II.

It is in regard to the manner of the increase, in the number of pathways of nervous impulses by means of sympathetic ganglia. Foster was the authority taken for the assertion made. It was found that where only comparatively few fibers left the spinal cord these are enormously increased in the peripheral distribution. They pass through sympathetic ganglia and it was supposed by many authorities that these ganglion cells were multipolar nerve cells. That the cells had two, three, four or even five processes continued as axis cylinders, hence the increased number of pathways for impulses. According to the latest authority such statements are erroneous. According to the latest authority such statements are erroneous. According to the investigations of Langley all nerve cells of the sympathetic ganglia are mononeuric, that is, that no sympathetic cell has more than one axis cylinder process.

How then are we going to account for an increase in the number of nervous pathways in the sympathetic system? We notice that the sympathetic cells are grouped in clusters called ganglia. These ganglia are interpolated between the efferent neurons of the spinal nerve roots and the peripheral plexuses or secreting cells. We then hane pre-ganglionic fibers. These arise from the spinal cord and pass to the ganglia mentioned. They are medullated fibers known as white rami-communicantes.

According to the studies of Gaskell these fibers leave the segments of the spinal cord from the first thoracic to the 4th or 5th lumbar and these only. These pre-ganglionic fibers are interrupted in the ganglia, hence we have post-ganglionic fibers which spring from the cells of the ganglia. As you know, most of these post-ganglionic fibers are gray or nonmedullated. Now we come to the real answer to our question. The number of cells in these interpolated ganglia are greater than the number of efferent neurons leaving the spinal cord. Hence the increase in the number of pathways toward the periphery.

The question then arises as to how the connection is made with all the sympathetic cells. According to the studies of Langley there are two ways in which the connections are made. By means of collaterals the pre-ganglionic fibers connect with one or more cells in a number of ganglia. The other way is by having connection with a number of cells in one ganglion. These cells then send their neurons directly to the peripheral structures governed by the sympathetic nerves or to the plexuses which are found in the organs so governed, such as the intestines and blood vessels. (Give Drawing).

There is yet this point, one sympathetic cell does not send branches to another sympathetic cell; that although the efferent pre-ganglionic fiber may connect with a group of cells so that the impulses which pass out are more numerous than those entering, the groups of cells in the ganglia are not connected. This shows the manner of diffusion.

What evidence is there of a continuous ongoing of impulses or diffusion from center to periphery?

One evidence is that normally there are impulses passing to both striped and unstriped muscles of the body (Explain) (Tonus). These impulses are normally very small yet they are subject to great variations. (Athlete, insane and convalescent).

The continuous outflow of these impulses is marked by the changes in glands and the variation is noted according to the amount of impulses sent out from the central nervous system.

This tonicity of muscle and metabolic changes in glands is not only an evidence of outgoing impulses but of afferent ingoing impulses as well. Showers of impulses from sensory organs all over the body pass to centers. Emotional conditions lead to activity of brain cells, which causes an increase in efferent impulses as instanced by increased muscular tension. The proof of this last statement is the relaxation that occurs when the mental excitement ceases. That such a tension exists in a greater or less degree is shown by the relaxation that occurs when sleep comes on.

The second point which I wish to correct is found in lecture XIV: When muscles contract there is a stimulus to the sensory nerve endings which carry impulses to the vasy-motor center and there cause an inhibition of constrictor vaso-motor impulses. This you see leads to a reflex dilatation of the blood-vessels of muscles. If the area so innervated was large there would be a reflex fall in blood pressure.

This is somewhat erroneous. Some authors say there are no vaso-constrictor fibers to the blood vessels of muscles, others say that only a few vaso-constrictors s supply these vessels. Hence it is not through the vaso-constrictors that the blood vessels are controlled. It seems that the movement of the muscle causes an enlargement of the vessels of the part, thus increasing the amount of blood sent to the muscle. Another way in which the blood is increased in amount is reflexly. This reflex act is brought about in the following manner. The sensory nerves end between the muscular fibers. When the fibers contract this acts as a stimulus to these nerves. This produces an impulse which is carried to the vaso-dilator center which causes it to act. A dilatation of the blood-vessels of this area follows and the amount of blood to the muscle is thus increased. This is of inestimable value: At every move the oxygen stored in the tissues and in the blood is used and the results of metabolism loosed in turne The blood and lymph streams are the means of furnishing an increase in the amount of oxygen and also a way to carry off the results of oxidation. The osteopath makes use of this very principle in his work on the body. By the passive treatments he may give to the muscles he is bound to hasten the sluggish lymph stream and thus rid the tissues of the results of metabolic process. He also increases the amount of nutrient material to the part by dilatation of the blood-vessels of the area, hence giving them new life. These points you should remember in your work and give no moves unless you have a definite end in view, a certain result to accomplish.

The last point in our lecture to-day is the theory of our work in spinal curvatures. I have touched upon this point a few times during the course of our lectures as well as the point where disease of the spine is most likely to begin. It was found that where a more and less elastic body join was the weakest point of any tissue, hence the junction of the body of vertebra and intervertebral substance was the weakest point. The tensile strain brought to

bear on the column at these points was very likely to cause disease. In our treatment of spinal curvature we have the patient on the side, relax the tissues, then reach over the spines and carry them upward by springing. We do this on each side of the column. We bend the spinal column both backward and forward and from side to side. We bring straight traction to bear on the spine and gradually replace the whole column as we would attempt to replace a single vertebrae.

Why do we relax the tissues on each side of the spinal column and spring the spines upward?

This is for the purpose of releasing any contracture we may find there and thus getting rid of one source of irritation. Then we spring against the spines for the purpose of putting the column in a straight condition, also for changing the shape of the intervertebral substance. There

There is yet another reason why we give this treatment, the straight traction, bending from side to side, backward and forward. This reason is really the object of the work. A strengthening and stimulating treatmentt is necessary for a part of the tissues. Undue contractures and the one-sided flattening of the intervertebral substabce must be overcome. I will show you how this is brought about.

There is a special circulation and nerve supply to the interior of the spinal canal, also to the bodies of the vertebrae and ligaments and arteries around the canal.

The nerves are from the recurrent spinal branch (origin), also a recurrent branch from the sympathetic (origin), these pass through the foramen and between the surrounding ligaments and tissues. Hence any injury, as from a strain, twist, etc., is sure to affect these nerves and the blood supply of the canal. Our object then is to remove these lesions and thus cause a return of the normal blood supply and the proper amount of nervous impulses.

I think you can readily understand why this in necessary. The elasticity and normal mobility of the column are dependent upon the normal blood supply and the passage of the requisite amount of nerve impulses.

We know that a lack or overplus of blood supply to nerve centers affects them readily as furnishing the means of changing the normal chemical constitution. Thus you see why we remove every irritant to nerve centers and every obstruction to blood centers, whether in the form of misplacements, subluxation, contractures, etc.

LECTURE L - 1.

How to examine a patient:

Method is one thing to which we must habituate ourselves. To be able to do all our work with dispatch, not hurry, will gain a point for us every time. You must know when you have done enough, then stop. Before people get to know you they judge you by the way you approach their cases, not with a halting, as if you knew nothing about it, nor again as if you knew it all and none must presume to doubt it. The one mistake as as unforgiven as the other.

I cannot lay down any hard and fast rule for your use in an examination. The exigences of the case must govern you every time. To have a definite plan in view is the reason I give you this. It may not be necessary to go over one-half of what I give, and other times it is.

One patient may come to you in whom you may soon localize a trouble and get to a part of their difficulty, at least, in a very few minutes. From the time the patient enters the room where you are, your eyes must be taking in details. There may be something in their walk as they approach you, telling you of serious trouble, the expression of the face, the condition of the eye and the general way of the patient all have their bearing on the case and must not be overlooked.

The first point in an examination is to get a history of the case. This you can do by judicious questioning. Then you are able to select the next step, in your judgment to make. It may then be so that you can go to the very seat of the difficulty directly, as in the case of misplacement. There are or will be patients coming to you that will say, "I do not care to give you much of a history of my case," they wish to find if an Osteopath is able to locate the difficulty by physical signs alone. It is because of such patients that I deem this lecture necessary.

You may next notethe condition of the heart as indicated by the pulse. If there are any indications that you should do so, find the temperature. At this time you may note the condition of the tongue. This may give you an insight as to the condition of the mouth and part of the alimentary canal. You are now ready to go to the examination of the body proper.

In a previous lecture we discussed the point as to preparation of patient for examination of the spine. The condition of each and every vertebrae is noted; the general condition of the spine and curves. You are familiar with the results, if there is any misplacement, any abnormality of the curves or any contractures. You would next complete the examination of the spine by an examination of the neck. Here is where lesions may produce far reaching results and it is necessary for you to carefully locate each vertebra and any growths in the neck, and in this way discover any abnormality present.

You may readily note the results to any of the different plexuses of nerves. While on the lower part of the spine, in females, note any condition that would point to kidney and pelvic troubles. Here is where you must note the puffiness under the eyes and the indication of such puffiness, as well as the dafk rings under the eyes, seen at times in both male and females. While examining the neck you must find the condition of the tissues under the angle of the jaw as well as the muscles on the front and sides of the neck. Next you must examine the thorax. You have been shown how to examine ribs, taking each one separately and if needs be to follow them from the head to the cartilage. The patient may be either

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on the side or the back. In fact, it is generally necessary to have them first on the back then the side, to complete the examination of the ribs successfully. This would be followed by an examination of the heart. The first notation of such trouble would be when you felt the pulse. Now you would map out the praecordial space and then note the different heart sounds by auscultation. A good work on physical diagnosis ought to be studied closely, else the sounds you hear jay not tell you anything.

The lungs must be examined closely. The different methods of examinations have been given, but not the significance of palpation or ausculted sounds. These sounds are of especial interest to us in all lung troubles. By careful examination you may be saved from a diagnosis and prognosis which would be discreditable to you.

The clavicle would next follow; then an examination of the shoulder joint. The entire arm must be examined if you find it necessary.

I have explained to you how to proceed to an examination of the abdomen and the contents of the contained viscera, also the location of each in turn. I think it unnecessary to repeat here. The pelvic contents are of considerable consequence. Their examination would follow. All external signs and conditions are first noted, then a local examination would be in order. If there is pan pain expressed by some of the nerves of the sacral plexus it is best to follow the nerve from the peripheral distribution to the center. This is for the purpose of discovering if any lesion or other pressure is situated somewhere along the course of the nerve in question.

The pelvic bones must be examined and the limbs, the lower ones.

By the two lines I mentioned, one perpendicular to the other, , the first being drawn from one iliac, anterior superior spine to the other will show any tilt of the pelvic.

As a help we also use the tenderness of the ligaments and position of the posterior superior spines to the sacrum. Our decision can then be made. With respect to the hip joint it may be more difficult.

It may be that you must depend or at times trust to measurements by the eye and the flat of the hand. The thumbs would be placed firmly on the spines of the ilia, then the fingers grasp the great trochanter on each side. Use the sound side for comparison, it being the standard, the hand then generally detects any displacement of the injured side.

There is a line, Nelaton's, which is sometimes of use to us.

This line is drawn from the anterior superior spine of the ilium to the most prominent part of the ischium. It runs through the center of the acetabulum and corresponds to the top of the great trochanter.

The extent of displacement in dislocation or fracture is marked by the extent of projection away from this line. To be sure where the shortening of the limb is situated at all times, may be very hard to find. If the hip joint can be moved it is not so difficult. (Explain). Then complete the examination of the legs. It is well in a great many of your cases to get a sample of urine, examine it before giving a complete diagnosis. By the summation of the history and all points found in the examination, you are able to form your diagnosis.

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Lecture XXXVI.

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mentioned-Treatment of Entozoa-Causes of Constipation and Effect of Blood Supply and Nerve Supply on Constipation.

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Diarrhea, Dysentery and Flux-Definition and Existing Condition of Diarrhea-Theory and Idea of Spinal Lesion as Primary always, Erroneous and Why-Definition and Existing Condition of Flux, Dysentery-Theory of Trouble-Treatment of Chronic Diarrhea-Spine, Liver and Abdomen-Treatment of Flux-Pelvis, how Bounded-Gluteal Fold-Locating Gluteal and Pudic Arteries; Pudic and Sciatic Nerves- The Perineum, its Boundaries-True Perineum and Importance of Normal Tone to it-Examination of Pelvis.

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Examination of pelvis-Cause of Soreness and Tenderness at Sacro-Iliac Articulations-How to Detect Tilting of Pelvis-Treatment of Pelvis-Nervous Connections of Generative Organs-Vaso-Motors to External Organs-To Internal-Principal Nerves to Reach Them-Bladder, its Double Nerve Supply and Effect-Treatment-Connection between Anal Region and Bladder-Connection between Testicle and Solar Plexus-Treatment of Bladder-The Prostate Gland, position, Connection with Buttock and Perineum-Treatment.

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Lecture XLVIII.

Enlarged glands from Disease-Two Sets in the Groin-Treatment of the Lymphatics-Lymphatics and Obesity-The Treatment-The Lower Extremities-Hip Dislocations-Femoral and Saphenous Openings-Treatment-Stretching Muscles of Lower Limbs and Treatment-Upper Limbs Misplaced and Replaced-Stimulating Lymph flow and Treatment.

Lecture XLIX

Correction on Lecture Two, that Sympathetic Cells are Mono-neuric-The Ganglia, Pre and Post Ganglionin Fibers-Evidences of Outgoing Impulses, of Oingoing-Correction of Lecture Fourteen-The Idea of Dilatation of the Vessels of Muscles being caused Reflexly, through Sensory Impressions acting on the Vaso Dilators-Theory of Work on Spinal Curvature-Recurrent Nerves to Cord and Effect on Blood Supply.

Lecture L

How to Examine a Patient.